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Faculdade de Psicologia

Evidence-Based Clinical Decision-Making: Conceptual and Empirical Foundations for an Integrative Psychological and Neurobiological Transtheoretical Metamodel

Vitor Bruno Faustino Almeida

Orientador(es): Prof Doutor António José dos Santos Branco Vasco

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Tese especialmente elaborada para obtenção do grau de Doutor em Psicologia na especialidade de Psicologia Clínica

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2021

"Rise and fake it all… And it feels that you´re the one…

And you faked it all… Who will show what you become…

Finally, drained… But that drive deep in yourself…

But you still hate them all… It feels you´re someone else…."

Bruno Faustino, *Fake it all*

The Cold and the Craving 2021

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x

DECLARATION

Based on the Article 41 of the Regulation for the Postgraduate Studies of the University of Lisbon, approved by the Rectory No 1506/2006, the present doctoral thesis encompasses several scientific articles submitted for publication to international indexed journals in collaboration with other authors. Literature review, data collection and analysis, interpretation of the results, writing and submission of the papers was the responsibility of the author.

Vitor Bruno Faustino Almeida

April, 2021

ABSTRACT

The dialogue between psychotherapy and neuroscience is ongoing. Previous meta-analytic research suggests that 35% of psychotherapy outcome variance is not fully explained, whereas 30% is attributed to patient variables, 15% to therapeutic relationship, 10% to specific therapeutic techniques, 7% to therapist variables and 3% to other factors (Norcross & Wampold, 2019). Several authors emphasize the need for integrative, metatheoretical or transtheoretical approaches to enhance conceptual understanding of clinical phenomena, augmenting psychotherapy responsiveness to patients' significant variables, such as maladaptive patterns, states of mind, relational styles, emotional difficulties, neurocognitive deficits, and psychological needs. The present doctoral proposal aims to respond to these claims through the establishment of preliminary conceptual and empirical foundations for an Integrative Psychological and Neurobiological Transtheoretical Metamodel. First, an extensive literature review of the relationships between psychotherapy and neuroscience was performed to establish theoretical and conceptual integration of different components of the presently proposed model. Second, several methodological aspects were described to systematize the complex data acquisition process. Third, seven studies were conducted, and implications of the results were discussed. Fourth, an integrative discussion was elaborated, emphasizing the major and general implications of the results for clinical practice and future research.

The first empirical study aimed to develop and/or adapt self-report assessment measures to evaluate several psychological variables (e.g., metacognition, states of mind), which resulted in five scientific articles. Thus, the Metacognitive Self-assessment Scale (Pedone et al., 2017) and the Inventory of Interpersonal Problems – 32 (IIP-32, Barkham et al., 1998) were validated and adapted to European Portuguese. The State of Mind

Questionnaire (SMQ, Faustino et al., 2021b, Emotional Processing Difficulties Scale – R (EPDS-R, Faustino et al., in press) and the Clinical Decision-Making Inventory (Faustino & Vasco, in press) were developed. All instruments showed satisfactory psychometric properties. Nevertheless, the SMQ showed low reliability in the composite scales in smaller subsamples.

For the second empirical study, the main aims were to explore the complex relationships between early disorder determinants, maladaptive schemas and states of mind, defensive maneuvers and critical consequences, mental skills and processes, and adaptive self-domains. This was performed with Structural Equation Modeling (SEM). Results showed significant sequential and mediational models between maladaptive schemas, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains with psychological needs. Maladaptive schemas and states of mind were both predictors and mediators in several models. However, the relationship between maladaptive schematic functioning and symptomatology had less significant mediations with the same variables.

For the third study, the main aims were to explore the relationships of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains, with several neurocognitive variables. Executive functions were negatively correlated with maladaptive schematic functioning and with defensive maneuvers and dysfunctional consequences. Memory only correlated with psychological needs, self-confidence and with dysfunctional interpersonal cycles. These results emphasize previous assumptions that there is a difference between self-report questionnaires and neuropsychological assessment measures which may difficult the integrated study of psychological and neurocognitive processes.

The fourth study aimed to explore the associations of affective subliminal processing with dispositional states and contextual states, defined in the present work as early disorder determinants, schematic functioning, and defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains. Results showed strong correlations between maladaptive schematic functioning, coping responses, emotional processing difficulties, and expressive suppression with behavioral responses. Dispositional traits and contextual states seem to be associated with affective processing, especially when it comes to the neutral valence of the subliminal stimuli. ERPs waveforms showed an amplitude modulation with a temporal progression: in the first 100 msec the waveform amplitude was highest to the negative condition; Later on, in the time windows after 350 msec, the neutral condition was the one that elicited the ERPs' heist amplitude. These indexes a cascade of reactions, first a priority to nonconscious negative stimulation; and after that, a later processing phase of affective-cognitive interpretation (350msc) in which neutral stimuli acquire a meaning according to schemas.

The fifth study explored the diagnostic and or transdiagnostic potential of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains. Results showed that only early complex trauma and expressive suppression were not statistically different in two subsamples. Individuals in the low-symptoms sub-sample reported lower levels of maladaptive schematic functioning, defensive maneuvers, and psychological inflexibility than individuals in the higher-symptoms subsample.

The sixth study was focused on the exploration of the temporal stability of maladaptive schematic functioning and states of mind, defensive maneuvers and

dysfunctional consequences, mental abilities, and adaptive self-domains. Results showed significant differences between moment one and two, with a descending pattern in the mean scores of dysfunctional variables. An inverse pattern was found regarding the adaptive variables. However, mean scores of some variables, such as early maladaptive schemas, emotional schemas, psychological needs, and cognitive reappraisal were not statistically significant.

The seventh study aimed to explore associations of early disorder determinants, maladaptive schemas and states of mind, defensive maneuvers and critical consequences, mental skills and processes and adaptive self-domains, with an empirical based clinical profile (e.g., psychotherapy and motivational stage, coping styles). Results showed significant negative correlations between maladaptive schematic functioning and stage process, motivational stage, therapeutic relationship, attachment style, reactance, and coping style. An inverse pattern was found regarding the adaptive variables.

These preliminary results seem to support a theoretically- and empirically-based integrative and transtheoretical metamodel focused on unifying psychotherapy and neuroscience into a coherent framework. Further research is required to augment and enhance the presently proposed model.

RESUMO

O diálogo entre psicoterapia e neurociência mantém-se atual. Meta-análises prévias sugerem que 35% do resultado da psicoterapia não é totalmente explicado, enquanto 30% é atribuído às variáveis do paciente, 15% à relação terapêutica, 10% a técnicas terapêuticas específicas, 7% às variáveis do terapeuta e 3% a outros fatores (Norcross & Wampold, 2019). Diversos autores salientam a necessidade do desenvolvimento de abordagens integrativas, metateóricas ou transteóricas no desenvolvimento de quadros conceptuais para a observação de fenómenos clínicos, potencialmente ampliando a responsividade psicoterapêutica às variáveis significativas dos pacientes, como padrões disfuncionais, estados mentais, estilos relacionais, dificuldades emocionais, déficits neurocognitivos e necessidades psicológicas. Assim, no sentido de dar resposta a essa necessidade, a presente proposta de doutoramento pretende estabelecer os fundamentos teóricos e empíricos preliminares para um Metamodelo Transteórico e Integrativo Baseado em Variáveis Psicológicas e Neurobiológicas. Primeiro, realizou-se uma extensa revisão da literatura das relações entre psicoterapia e neurociência, de modo a estabelecer a integração teórica e conceptual de diferentes variáveis do presente modelo. Em segundo lugar, vários aspetos metodológicos foram descritos de modo a sistematizar a recolha de dados. Terceiro, realizaram-se sete estudos e as implicações dos resultados foram discutidas. A seguir, foi elaborada uma discussão integrativa, salientando-se as implicações principais e gerais dos resultados para a prática clínica e investigações futuras.

O primeiro estudo empírico teve como objetivo desenvolver e/ou adaptar medidas de avaliação de autorrelato para avaliar diversas variáveis psicológicas (por exemplo, metacognição, estados mentais), que resultaram em cinco artigos científicos distintos. A Escala de Autoavaliação Metacognitiva (Pedone et al., 2017) e o Inventário de Problemas

Interpessoais - 32 (IIP-32, Barkham et al., 1998) foram validados e adaptados para o português europeu. Foram também desenvolvidos os seguintes questionários: Questionário de Estados Mentais (SMQ, Faustino et al., 2021b, Escala de Dificuldades de Processamento Emocional- Revista (EPDS-R, Faustino et al., para publicação), e Inventário de Tomada de Decisão Clínica (Faustino & Vasco, no prelo). Todos os instrumentos apresentaram propriedades psicométricas satisfatórias; porém, o SMQ apresentou baixa consistência interna nas escalas compósitas em subamostras menores.

O segundo estudo teve como objetivo explorar as relações complexas entre os determinantes precoces fundamentais, os esquemas e estados mentais disfuncionais, as manobras defensivas e as consequências críticas, as competências e processos mentais e os estados mentais adaptativos. As hipóteses foram exploradas com recurso a Equações Estruturais Lineares (SEM). Os resultados mostraram modelos sequenciais e de mediação significativos entre esquemas disfuncionais, manobras defensivas e consequências disfuncionais, competências e processos mentais e estados mentais adaptativos com necessidades psicológicas. No entanto, a relação entre funcionamento esquemático disfuncional e sintomatologia teve menos mediações significativas dentro das mesmas variáveis.

No terceiro estudo, os objetivos principais foram explorar as relações entre os determinantes precoces fundamentais, funcionamento esquemático disfuncional e estados mentais, manobras defensivas e consequências disfuncionais, competências e processos mentais e estados mentais adaptativos com diversas variáveis neurocognitivas. As funções executivas correlacionaram-se negativamente com o funcionamento esquemático disfuncional e com manobras defensivas e consequências disfuncionais. A memória correlacionou-se positivamente com as necessidades psicológicas, autoconfiança e ciclos interpessoais disfuncionais. Esses resultados estão alinhados com a literatura prévia, onde

há uma diferença entre questionários de autorrelato e tarefas potenciais que podem dificultar a exploração e integração de processos psicológicos e neurocognitivos.

No quarto estudo procurou-se explorar as associações entre o processamento emocional subliminar com estados disposicionais e contextuais, definidos no presente trabalho como determinantes precoces fundamentais, funcionamento esquemático e manobras defensivas e consequências disfuncionais, competências e processos mentais e estados mentais adaptativos. Os resultados mostraram correlações fortes entre funcionamento esquemático disfuncional, estratégias de *coping*, dificuldades de processamento emocional e supressão expressiva com respostas comportamentais. Traços disposicionais e estados contextuais parecem estar associados ao processamento afetivo, principalmente quando se trata da valência neutra dos estímulos emocionais subliminares. As formas de onda de ERPs mostraram uma modulação de amplitude com uma progressão temporal: nos primeiros 100 ms, a amplitude da forma de onda foi mais alta para a condição negativa; Mais tarde, nas janelas de tempo após 350 ms, a condição neutra foi a que desencadeou a maior amplitude do ERPs. Estes dados sugerem uma cascata de reações, primeiro uma prioridade para a estimulação negativa inconsciente; e, em seguida, uma fase posterior de processamento da interpretação afetivo-cognitiva (350msc) em que estímulos neutros adquirem um significado de acordo com o funcionamento esquemático disfuncional.

O quinto estudo teve como objetivo explorar o potencial diagnóstico e/ou transdiagnóstico de determinantes precoces fundamentais, funcionamento esquemático disfuncional e estados mentais, manobras defensivas e consequências disfuncionais, competências e processos mentais e estados mentais adaptativos. Os resultados mostraram que apenas o trauma complexo precoce e a supressão expressiva não foram estatisticamente diferentes em duas das duas subamostras. Os indivíduos na subamostra

não clínica relataram menos sintomas, níveis mais baixos de funcionamento esquemático disfuncional, manobras defensivas e inflexibilidade psicológica do que os indivíduos na clínica.

O sexto estudo foi focado na exploração da estabilidade temporal do funcionamento esquemático disfuncional e estados mentais, manobras defensivas e consequências disfuncionais, competências mentais e estados mentais adaptativos. Os resultados mostraram diferenças significativas entre os momentos um e dois, com padrão descendente na pontuação média das variáveis disfuncionais. Um padrão inverso foi encontrado em relação às variáveis adaptativas. No entanto, as pontuações médias em algumas variáveis, como esquemas precoces disfuncionais, esquemas emocionais, necessidades psicológicas e reavaliação cognitiva, não foram estatisticamente significativas.

O sétimo estudo teve como objetivo explorar associações entre determinantes de transtorno precoce, esquemas e estados mentais disfuncionais, manobras defensivas e consequências críticas, competências e processos mentais e adaptativos, com um perfil clínico de base empírica (por exemplo, psicoterapia e estágio motivacional, estilos de enfrentamento). Os resultados mostraram correlações negativas significativas entre funcionamento esquemático disfuncional, etapa motivacional, qualidade da relação terapêutica, estilo de vinculação, reatância e estilo de coping. Um padrão inverso foi encontrado em relação às variáveis adaptativas.

Os resultados da presente proposta de doutoramento sugerem a sustentação preliminar de uma base conceptual e empírica para um metamodelo integrativo e focado na unificação entre psicoterapia e da neurociência. Contudo, são necessárias mais investigações no sentido de exploração e validação do presente modelo proposto.

Palavras-chave: Trauma complexo precoce; Esquemas disfuncionais; Estados Mentais;

Coping; Metacognição; Neurocognição; Processamento afetivo; Psicoterapia

Integrativa; Tomada de decisão

CONTENTS

PART ONE: THEORETICAL CONSIDERATIONS

PART TWO: GENERAL METHODOLOGY AND PROCEDURES

PART THREE: EMPIRICAL STUDIES

PART FOUR: INTEGRATIVE DISCUSSIONS AND FINAL THOUGHTS

APPENDIX

LIST OF TABLES

Study 7

LIST OF FIGURES

LIST OF ACRONYMS

ABT – Attachment-Based Therapy

ACC – Anterior cingulate circuit

ACT – Acceptance and Commitment Therapy

AHMN – Amygdaloid-hippocampal memory network

BSI-53 – Brief symptom inventory

BDRT – Brief-Dynamic Relational Therapy

CBT – Cognitive Behavior Therapy

CCRT – Core Conflictual Relationship Theme

CFQ – Cognitive Fusion Questionnaire

CRF - Complex Rey Figure

COMT – Catechol-O-methyltransferase

CTQ-SF – Child Trauma Questionnaire – Short Format

CT – Cognitive Therapy

DSQ-28 – Defensive Styles Questionnaire

DNA - deoxyribonucleic acid

DMN – Default mode network

DLPC – Dorsolateral prefrontal circuit

EEG – Electroencephalography

EFT – Emotion Focused Therapy

EPDS-R – Emotional Processing Difficulties Scale-Revised

EMDR – Rapid Eye Desensitization

ESS-50 – Emotional Schemas Scale

ERQ – Emotion Regulation Questionnaire

FPEN – Frontal-parietal executive network

FMR – Functional Magnetic Resonance

GxE – Gene-environment interaction

GWAS – genome-wide association studies

IIP-32 – Inventory of Interpersonal Problems

IRPQ – Interpersonal Relational Patterns Questionnaire

LFLN – Left hemisphere language network

MAOA – monoamine oxidase A

MIT – Metacognitive Interpersonal Therapy

MMFM – Metacognitive Multi-Function Model

MSAS – Metacognition Self-Assessment Scale

NSRS-43 – Needs Satisfaction Regulation Scale

OFC – Orbitofrontal circuit

PCM – Paradigmatic Complementary Model

POC – Obsessive-Compulsive Disorder

SMQ – States of Mind Questionnaire

SASB – Structural Analysis of Social Behavior

SAS – Supervision Attentional System

SN – Salience network

SREF – Self-Regulatory Executive Function

ST – Schema Therapy

REBT – Rational Emotional Therapy

rGE – Gene-environment correlation

TEMPS-A – Memphis, Pisa, Paris and San Diego Temperament Assessment Scale

TEP – Positron Emission Tomography

TEPS – Emission Tomography Simple positrons

VMC – Ventromedial circuit

WCST – Wisconsin Card Sorting Test

WMS-III – Weschler Memory Scale

WAIS-III – Weschler Adult Intelligence Scale (WAIS-III)

YSQ-S3 – Young Schema Questionnaire

YPS – Young Parenting Inventory

5-HTT – Serotonin transporter gene

PART ONE: THEORETICAL CONSIDERATIONS

Introduction

    We live in challenging times! New and exciting scientific discoveries are documented daily. New methodologies are opening new avenues to explore new paths that may lead to new perspectives about old phenomena. This doctoral proposal is not the culmination of 4 years of work. But rather, this project is a culmination of more than 10 years of dedicated study in psychology and neurosciences. The curiosity for the identification, description, modulation, and/or action over human phenomena is an intrinsically condition for every scientist. Human beings are composed of an intricate and complex set of motivations that underlie observable behavior. There are so many structural and functional variables that contribute to the human experience that it is almost overwhelming to think about how we might solve the problem of complexity. Psychological and neurobiological scientists tend to reject one-dimensional explanations for multivariate manifestations resulting from interactions at different levels of explanation/abstraction and complexity at various stages and contexts. Human behavior may have countless causal explanations. Naturally, to explore and describe the complexity of human behavior at several levels of abstraction, this doctoral proposal is based on transdisciplinary constructs and metaparadigms within an integrative perspective regarding psychological and neurobiological mechanisms and processes. The satisfaction that I feel for being able to develop a doctoral thesis based on my perspective is a gift that was beyond my estimation.

    This proposal takes inspiration from different theoretical approaches and clinical models that are well established in the literature. Each model contributed differently to the development of several domains that encompassed the framework of the present doctoral thesis. It may be difficult to differentiate all the contributions from those models in an accurate manner because different models may have contributed to different/same

domains. However, it is possible to list and differentiate the major contributions for each specific domain. First, to establish the foundational organization and ontological perspective, the Unified Psychotherapy Project (Magnavita, 1997, 2004) and Paradigmatic Complementarity Metamodel (Vasco, 2005; Vasco et al., 2018) were used. Second, to establish the disorder theory, several elements from Schema Therapy (Young, et al., 2003), Evolutionary Neurobiology (Liotti, 2000; Raichlen, & Polk 2013) and Psychology (Buss, 2005), and Interpersonal Neurobiology (Siegel, 2012), were used to understand how several variables contribute to schema formation and psychological disorders. Third, to elaborate a coherent case conceptualization structure, elements from Emotional Schema Therapy (Lehay, 2015), Metacognitive Interpersonal Therapy (Dimaggio et al., 2015), Emotion Focused Therapy (Greenberg, 2015) and Third Generation Cognitive Therapies (Hayes et al., 2011; Gilbert, 2010) were articulated to develop an integrative model. Fourth, to accommodate neurocognitive variables into the present structure, the models of Neurocognitive Psychological Syndrome (Faustino, 2021), and Integrative Model of Executive Functions (Diamond, 2013), were used. Fifth, Neuropsychotherapy (Grawe, 2007; Cozolino, 2017), Affective Neuroscience (Panksepp, 1998, 2005; LeDoux,1998, 2012), and Social Neuroscience (Cacioppo, et all., 2010) were used to expand and to integrate the neuroscience domains into the present work. Finally, the Schema and Mode work (Young, et al., 2003), Process Model of Psychological Flexibility (Hayes et al., 2011), Marker-Guided Intervention (Elliott et al., 2004; Greenberg & Goldman, 2019), Transtheoretical Model of Change (Prochaska & DiClemente, 1983) along with the Stage Model of General Stage Strategies (Vasco et al., 2018), and General Principles of Change (Goldfried, 2018) were articulated in a state vs trait vs construct intervention based on stage responsiveness. To articulate all those models was a challenge beyond my predictions.

Built on previous research (Almeida, 2015, 2016, 2018; Barreira, 2016; Castelo-Branco, 2016; Faustino, 2020, 2021; Faustino & Vasco, 2020a,b,c; Faustino & Vasco, 2021; Faustino et al., 2019a,b,c; Faustino et al., 2020a,b,c; Gonçalves, 2020; Ferreira, 2020; Martins, 2016; Sol & Vasco, 2017; Vasco et al., 2018; Vaz, 2018), this project aims to expand and develop a transtheoretical and integrative framework encompassing a flexible perspective on the integration between clinical psychology/psychotherapy and neuroscience. This project is divided into three main domains: adaptation theory, disorder theory and intervention theory. Adaptation theory consists of all the adaptive processes and variables that allow humans to develop, achieve, and maintain a coherent sense of self, life satisfaction and psychological well-being. Disorder theory is all the maladaptive processes and variables that disrupt and/or impair the healthy human development, with a dysfunctional outcome in psychological well-being. Finally, intervention theory is all the therapeutic interventions that are focused on the re-establishment of psychological well-being and mental health in a wide sense (Vasco et al., 2018). These are the three major domains in the present work. Thus, the development of this model is based on the intersection between theory and research, aiming to become a clinical and research resource for those who want/need to incorporate psychotherapy into the study of neuroscience or to incorporate neuroscience in psychotherapy so as to enhance responsiveness. If it seems a dauting task, it is because it is so!

To accomplish the purposed goals in this research project, the development of new core skills was needed. As a trained clinical psychologist and neuropsychologist, I was already experienced in psychological and neuropsychological assessment and the respective interpretation of the data. However, this project took me one step further. In this sense, I sought to acquire multidisciplinary knowledge, both at a theoretical and technical level. Fundamentally, new skills were acquired regarding the technique of

electroencephalography and everything associated with it, from behavioral application to data analysis with FieldTrip (MatLab).

The present doctoral thesis is divided into four parts, which are divided into several chapters. The first part, entitled "*Theoretical Considerations*", consists of a detailed exposition of the theoretical bases and empirical data that support the scientific investigation carried out. The second part, entitled "*General Methodology and Procedures*", will describe the standard methodologies and procedures adopted in the present doctoral thesis. The third part, entitled "*Empirical Studies*", will describe seven different studies of the present research, each one with a specific section for introduction/conceptualization, methodology, results, and discussion. In the fourth part, entitled "*Integrative Discussion and Final Thoughts*" a comprehensive and integrated analysis of the results will be presented along with the limitations and theoretical implications. I will now summarize the contents of the chapters of the three parts that characterize the present study.

In the first part, the first chapter, named "*A new look at intrinsic features of a translational metaparadigm*", will introduce the philosophical and ontological bases that were required to develop a higher abstraction level to articulate the present work conceptualization. The need for metatheories will be conceptualized within the problem of multidimensional approaches to complex phenomena, which are also associated with different worldviews. However, I will emphasize that the present work stands for a dialectical constructivism perspective when it comes to integrating biology and psychology, which is rooted in the new scientific evidence of mind-brain interactions. I defined this as a call for a neurobiological perspective on psychotherapy. The first chapter will end with a contextualization of the transtheoretical, diagnostic, and transdiagnostic

perspectives, as a flexible response for the disorder-specific or disorder- general approach.

The second chapter is called "*Towards an integrative disorder theory*" and will be focused on the conceptualization of an integrative disorder theory. The dichotomy of the gene-environment interplay and epigenetics will be framed as the foundational understanding of how early complex trauma, dissociation, parenting styles, and affective temperament combine to foster psychological vulnerability and/or psychological disorder. All these factors seem to play a major role in experienced-based early learnings that are developed in the presence of the activation of evolutionary neurobiological motivations and core psychological needs. Thus, the present work is aligned with the perspective that early maladaptive experiences are the core dysfunctional factor for long-lasting psychological disorders. Thus, research clearly supports this assumption.

The third chapter, named "*Beyond a single theoretical approach to case conceptualization*", will be focused on the development of a comprehensive framework based on the previous chapter, to accommodate several psychological constructs. It will be divided into three sub-chapters. The first is called "*Diversity of the schematic functioning and states of mind*", and it will encompass a unified processing theory as a proposal for the multimodal schematic functioning when it comes to cognitive, emotional, and interpersonal schemas. Also, it will describe how states of mind and schema modes can be related, especially to represent different aspects of the self. The second sub-chapter is called "*Dysfunctional consequences and defensive maneuvers*", and will be focused on defensive mental stances, such as coping styles and analytic defenses that individuals develop to deal with emotional suffering. Emotional difficulties and interpersonal dysfunctional cycles will also be framed as dysfunctional consequences of maladaptive functioning. These variables may be viewed as maintenance factors. Finally, the third

sub-chapter, called "*Mental skills and adaptive processes*", will encompass several adaptive mental abilities, such as metacognition, psychological flexibility, and emotion regulation, and adaptive mental domains that research has shown to soften maladaptive mental stances.

The fourth chapter is called "*Affective neuroscience and neurocognitive functioning in psychotherapy*" and it is the chapter where the neuroscience constructs will be described. Similar to the previous chapter, it will be divided into three sub-chapters. The first is called "*Neurocognitive functions and neuronal integration*", and it will encompass the foundations for the understanding of how neurocognitive functions, such as executive functions, attention and memory may be important in psychotherapy. The second sub-chapter is called "*Neurobiological contingencies of interpersonal interactions*" and will describe several neurobiological processes that underlie schema and states of mind formations and how it relates to the neuronal basis of the self. Finally, the third sub-chapter, called "*Non-conscious affective processing*", will articulate evidence of subliminal emotion processing with levels of emotional development and with an integrative of a bottom-up and top-down processes. Finally, electroencephalography will be described as a valid technique for studying event-related potentials related to non-conscious emotional processing.

The fifth chapter is called "*Clinical Decision-Making: A science-based approach to the process of change*" and will be focused on new scientific evidence that supports cognitive, emotional, and behavioral change. It will be divided in three subchapters. The first is called "*Scientific evidence for psychotherapeutic relationships and responsiveness that promote behavior change*" and describes the new discoveries concerned with psychotherapy outcome based on processes, psychotherapists' and patients' variables. The second subchapter is called "*Process models and trait vs state vs construct*

responsiveness" and it will be focused on the description of several mechanisms of change based on different theoretical orientations. The third subchapter is called "*Identification of phase-by-phase general strategies*" and will be concerned with a stage model rooted in several principles of change. In the sixth chapter, called "*Theoretical Integration*", a comprehensive integration of all variables will be elaborated to establish a coherent theoretical and empirical framework, which guides the understanding of this doctoral thesis.

The second part of the present work, which is called "*General Methodology and Procedures*", will describe the standard methodologies and procedures adopted in the present doctoral thesis. In this part, all the psychological and neuropsychological assessment measures used in this work are described, as well as all experimental stimuli. All methodological steps are also detailed.

The third part of the present work, which is called "Empirical Studies", will describe the six studies that are encompassed in the present work. The first study, named "*Psychometric validation of several assessment measures in the Portuguese Population*", is concerned with the six assessment instruments that were developed and validated for the Portuguese population. Only the abstracts will be described because these five instruments were already published in different scientific journals. The second study, named "*Complex mediations between schematic functioning, states of mind, dysfunctional consequences, and adaptive mental processes*", describes the several structural models regarding relationships between schemas, states of mind and defensive coping maneuvers in a cross-sectional design. The third study, named "*Relationships between psychological variables and neurocognitive domains related with psychotherapy*", describes the several structural models regarding several psychological and neurocognitive variables in a cross-sectional design. The fourth study, named

"*Relationships between subliminal affective processing and dispositional states and contextual states*", explores the associations between EEG experimental variables with psychological and neurocognitive factors. The fifth study, named "*Comparisons between clinical and non-clinical samples on core psychological domains",* describes a comparative analysis between non-clinical and clinical samples in several psychological and neurobiological variables. The sixth study, named "*Exploring temporal and contextual stability of maladaptive schematic functioning and states of mind, defensive maneuvers, mental abilities, and adaptive self-domains*", is focused on the longitudinal study of different psychological and neurocognitive variables. Finally, the seventh study named "*Associations between core dispositional traits and contextual states with clinical decision-making variables (clinical profile)*" is focused on explored the associations between maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and adaptive self-domains, with the Clinical Decision-Making Inventory (Faustino & Vasco, in press).

In the fourth part, entitled "*Integrative Discussion and Final Thoughts",* several final discussions and considerations will be stated. First, a holistic discussion regarding the findings of the study in terms of new perspectives and new contributions for the integration of the mind-brain debate will be outlined. Then, reflections regarding clinical and non-clinical variables that may represent transdiagnostic perspectives will be emphasized, along with the stages of the process of change. Finally, a new model, named "*Integrative Psychological and Neurobiological Transtheoretical Metamodel*", will be proposed to represent these new findings coherently into an empirically-based conceptual framework.

1. *A new look at intrinsic features of a translational metaparadigm*

The fundamental question regarding the boundaries between different scientific domains is intrinsically associated with the study of human beings through a scientific perspective. The complexity of human existence and behavior transcends the ordinary, being considered one of the most challenging phenomena to be understood (Kuhn, 1996; Cacioppo et al., 2010). Historically, science relied on research paradigms that were universally recognized, which provided a structured set of achievements, assumptions, concepts, and practices that solved problems and gave solutions to the community of science practitioners (Kuhn, 1996). Thus, paradigms unfold as foundational frameworks for consistency and coherence through different research-informed fields, which is a cornerstone for scientific development and new scientific discoveries (Norcross & Goldfried, 2019; Tyron, 2014). However, from time to time, a paradigm shift occurs due to the accumulations of different scientific discoveries that demand new perspectives, approaches, taxonomies, and/or methodologies for more adjusted worldviews. We are beyond the need to establish psychotherapy effectiveness (Norcross & Wampold, 2018, 2019; Norcross, & Lambert, 2019). Further demands are now focused on the reduction of the gap between science and clinical practice (Castonguay, Constantino, & Xiao, 2019; Teachman et al., 2012). Although awareness of the need to integrate science and practice is underway, there is still a long way to go (Castonguay, 2011; Castonguay, Constantino, & Xiao, 2019; Goldfried, 2018; Kazdin, 2008; Magnavita, 2010).

At the forefront of research, new methods and models for observing/explaining phenomena emerge, supported by modern multidisciplinary views, configuring a new "translational" and integrative science, with promising results in terms of understanding and relieving mental disorders (Barlow, 2014). From a very early age, psychology has sought to sustain its progress and knowledge using diverse transdisciplinary scientific

partnerships (Gonçalves et al., 2014). Currently, an increasingly important interdisciplinary dialogue is taking place between neurosciences and psychotherapy. This dialogue has a hidden potential for both the identification, characterization, and "optimization" of psychological and neurological mechanisms relevant to mental functioning, but also for clinical practice (Barlow, 2014; Gonçalves et al., 2014; Welsh & Martin, 2013).

This is the opening chapter of this doctoral thesis, which will serve, fundamentally, to establish the philosophical and ontological bases of this work at the deepest axiomatic level of knowledge. The first subchapter, called *"Metatheoretical and multidimensional approach to human complexity",* will establish the axiomatic structure that will underlie the entire work. The second subchapter, called *"Ontological worldviews and dialectical constructivism"*, is focused on the need to develop a higher-order ontological perspective regarding the integration of several levels of explanation. The third subchapter, denominated "*A call for a neurobiological perspective on psychotherapy*", will outline the foundational research that supports the integration of neuroscience data into psychotherapy. The fourth subchapter, which is called "*Transtheoretical, diagnostic and transdiagnostic perspectives*", will describe the empirical findings that support several perspectives when it comes to clinical decision-making regarding disorder-specific or transdiagnostic criteria.

a. A metatheoretical and multidimensional approach to human complexity

Human behavior is multivariate and multidimensional. There are virtually hundreds (if not thousands!) of different causal explanations for why such behavior occurs. However, the identification of causal links in psychological sciences has been a matter of debate throughout decades (Kazdin, 2008; Tyron, 2014). The identification,

description, and understanding of human complexity is not determined by itself but is determined by the degree of knowledge of the observer, wherein the internal schemas of reference play a distinctive role (Cacioppo et al., 2010; Cozolino, 2017; Vasco, 2005). However, human complexity transcends specific sciences and domains due to adaptive environmental and genetic pressures selected through the evolution process (Buss, 1995, 2011; Liotti & Gilbert, 2011). From neurons to social behavior, human complexity requires the integration of different approaches, perspectives, methodologies, and paradigms to deepen the level of understanding and comprehension of how behavior occurs and how psychotherapy improves the process of change (Cacioppo et al., 2010; Cozolino, 2017; Kandel et al., 2013; Siegel, 2012). The metatheoretical and multidimensional levels may be regarded from different perspectives and different theoretical standpoints from psychology and neuroscience. These perspectives are the two main driving forces in the present work. Typically, researchers and clinicians tend to be rooted in a paradigm wherein they feel knowledgeable and comfortable, which is very important for paradigmatic congruency in scientific developments (Goldfried, 2018). However, it is also important to know that relying on one paradigm tends to distract from other scientific sources (attentional blindness), which may also have important assets or discoveries (Vasco, 2018). Is this an inevitability in the research or clinical field? Maybe the answer is more complex than it seems.

To accommodate and articulate different phenomena from cells to over behavior, it is important to understand that a comprehensive framework is required. Cacioppo and Berntson (1992) suggested a multilevel integrative analysis where attention to phenomenon should be given at a microscopic level (neurosciences) and macroscopic level (social behavior). The authors suggested that the analysis of a given phenomenon on a level of organization may inform, refine, modulate or constrain another phenomenon

or another level of analysis which is dependent on the product of the interaction of several variables at different levels (Cacioppo et al., 2010). As an example, research showed that the effects of social isolation in humans related to increased hypothalamic–pituitary–adrenal axis activation and decreased inflammatory control (Cacioppo et al., 2011). Another example is the increased volume of the amygdala and the decreased volume on the hippocampus and several portions of the prefrontal cortex associated to stressful early environment (Davidson & McEwen, 2012). Or even the loss of memory abilities attributed to neuropathogenic mechanisms of Tau proteins and neurofibrillary tangles in the hippocampus, which are a hallmark of Alzheimer disease and the neurodegenerative disorders (Kandel et al., 2013). Examples like these are endless and they support the assumption that there are complex interactions between psychological processes and neurobiology at different levels.

It has been postulated that the doctrine of multilevel analysis can provide a full explanation of social behavior (Cacioppo and Berntson, 1992; Cacioppo et al., 2010). This doctrine has three basic principles. The first principle is *multiple determinism,* where an event that starts at one level of organization may have multiple antecedents within or across other levels of organization (e.g., action potentials in synaptic clefts may influence the activation of complex neural networks than induce complex behaviors). The second principle is the *nonadditive determinism*, which means that the properties of the whole are not always predictable from the sum of the properties of the other parts (e.g., the development of an early maladaptive schema based on a multiplicity of factors, such as frustration of psychological needs and selective internalization). The third principle is *reciprocal determinism,* which postulates that there can be mutual influences on biological and psychological variables (e.g., availability of receptive females in nonhuman primate influences the testosterone levels). These principles may be useful to

understand that different *low-level biological* variables (e.g., neurons, neural networks, neurohormones) and *higher-level psychological* variables (e.g., needs, schemas, states of mind) interact and influence each other to produce human experience and behavior.

In clinical psychology and psychotherapy, metatheories are associated with integrative efforts to develop higher-order theories to increase the levels of explanation of a given phenomenon (Goldfried, 2018; Norcross & Alexander, 2019). A metatheory may be defined as a higher-order theory about other theories which allows, mainly, for the integration and development of new concepts based on previous assumptions, such as schemas, defenses, and psychological needs (Faustino & Vasco, 2020a,b,c; Feyerabend, 1962; Kuhn, 1982; Pepper, 1942). A multidimensional approach may be defined as a perspective that considers different spheres and dimensions, such as psychological, biological, and contextual/social factors, to identify and describe human behavior (Cacioppo et al., 2010; Cozolino, 2017). In this sense, these two approaches (metatheoretical and multidimensional) may be combined to enhance a conceptual and theoretical framework that combines the different axes of the spectrum which will be described further.

According to Goldfried (1980), the development of metatheories is a long-lasting need in psychotherapy, partially due to the fragmentation of several schools. Several theoretical approaches made countless contributions to the understanding of human functioning. Goldfried (1982, 2018) postulated four levels of abstraction of psychotherapy to provide a coherent framework of orientation through different theories. At a higher level of abstraction are metatheories (e.g., contextual models), at a middle-higher level of abstraction are the common theoretical approaches (e.g., psychodynamic), at a middle-lower level of abstraction are the strategies (e.g., corrective experiences) and at the lower level of abstraction are the specific therapeutic techniques (e.g., exposure).

This framework takes precedence on the exploration of different approaches. The most recognizable theoretical approaches are psychoanalysis/psychodynamic and relational psychotherapies (Wachtel, & Gagnon, 2019), cognitive and cognitive behavior-oriented therapies (Beck, 1979; Beck et al., 2004; Castonguay, Newman & Holtforth, 2019), humanistic and gestalt therapies (Brownell, 2010; Rogers, 1965), systemic and system family's therapies (Gunn, Haley, Prouty, & Robertson, 2015) and integrative psychotherapies (Norcross, & Lambert, 2019; Prochaska & DiClemente, 1983). Each one of these approaches tends to emphasize specifications according to theoretical congruence, which may hamper other clinical phenomena. Thus, this may be regarded as attention bias (Vasco et al., 2018).

Furthermore, to understand complex phenomena from neurons to overt behavior in a moment-to-moment and longitudinal manner, the use of these levels of abstraction/explanation may be useful. For instance, communications between neurons may be defined as the lower level of abstraction. Communication between neuronal networks may be defined as the middle-lower level. The relationships between mind and behavior may be defined as middle-higher level of abstraction and contexts and symbolism may be viewed as the higher level of abstraction. Also, adding a temporal level to this conceptualization helps to understand life and stages progression in human development. These levels of explanation/abstraction combined with the described principles may work in a way that helps clinicians to better understand human phenomena in a more flexible manner. However, to understand how this framework interplays with dialectical process, it is required that we take an alternative epistemological and ontological perspective (Piaget, 1936).

b. Ontological worldviews and dialectical constructivism

Ontological perspectives about human phenomena and the nature of the world are indissociable from psychological approaches (Conceição & Vasco, 2005; Greenberg Goldman, 2019; Vasco, 2005). Intrinsically embedded in the way we describe reality, is a set of theoretical propositions, assumptions, rules, and laws that help us to make sense of what we are seeing and help us to define causal connections between structures and functions, causes and effects, biology and psychology (Cacioppo et al., 2000; Cozolino, 2002, 2017; Vasco, 2005). The Dodo bird verdict suggests that different psychotherapy approaches (with different ontological perspectives) may have similar therapeutic outcomes (Stiles, Hill & Elliot, 2015), supporting the assumption that different worldviews may be complementary (Vasco, 2005, 2018). The Dodo birdverdict refers to the notion that all empirically validated psychotherapies, despite all their specifications and discrete elements, produce equivalent outcomes (Vasco, 2018). In this sense, rather than an exclusive view of the world, maybe a meta-ontological and flexible perspective about how the world works lines up with an intellectually honest and enlightened attitude towards science and clinical phenomena (Cacioppo & Freberg, 2013; Cozolino, 2017; Tyron, 2014; Vasco, 2005, 2018). However, it is important to state that biology and psychology do not exist in a vacuum of structures, places, and contexts, which is why arbitrarily selecting one rather than the other may disregard important findings that could enhance not only theoretical views but also the clinical decision-making process (Grawe, 2007; Cozolino, 2017). Therefore, I will first briefly describe several worldviews that may be an asset for identifying and describing human behavior; second, I will describe the importance of the dialectical constructivism perspective on describing mind-brain relationships; and finally, I will propose a new ontological perspective that represents a *multilevel complexity-based dialectical constructivism.*

Vasco (2005, 2018) stated that different therapists may have different ontological worldviews rooted in their theoretical orientations for the case conceptualization and clinical decision-making and, normally, they tend to focus their attention on theoretically congruent constructs. Based on Pepper's (1942) worldviews, Vasco (2005) elaborated on how these worldviews/hypotheses may encompass different aspects of different theoretical approaches. The formist hypothesis (formism) states that reality is composed of discrete entities, similar or mutually exclusive, which is compatible with the development of taxonomies or nosologically oriented models (e., DSM). The mechanistic hypothesis (mechanism) describes that reality results from causal relations of cause-effect as antecedents and consequents, which is compatible with the traditional psychoanalytic drive (pulsional) models and the behavioral perspectives. The contextualistic hypothesis (contextualism) states that complex phenomena happen within a given context with different meanings, which is compatible with humanistic and systemic approaches. Finally, the organismic hypothesis (organicism) considers the world as a set of complex and integrated organic processes with multiple levels of interactions, which is congruent with the developmental psychology models. Vasco (2005) states that these four worldviews can even have an additive value (one includes the previous) increasing the spectrum of explanation due to the increasing layers of complexity. Thus, the application of these different worldviews can be congruent with the level of explanation that a given phenomenon requires from the observer (e.g., formist view regarding diagnostic criteria), which is why a flexible paradigmatic approach to science can be parsimonious.

Therefore, aligned with these useful and flexible perspectives on the philosophical and ontological understanding of the world, the perspective of the present work is based on a fundamental and universal scientific claim: human beings are products of evolutionarily shaped processes due to selective environmental and genetic pressures,

which were shaped and reshaped through epigenetic mechanisms through millions of years of evolution (Buss, 2011; Cacioppo & Freberg, 2013; Cozolino, 2002, 2017; LeDoux, 2012; Grawe, 2007; Panksepp, 1998; Siegel, 2012). Early humans lived different lives with different demands contextualized in different places (Buss, 2011; Panksepp, 1998), and the actions of early humans shaped the way that we behave today in a way that resembles a process of bioengineering through contextually related behaviors (Cacioppo & Freberg, 2013). Within a given context, early humans lived and adapted to their social contexts and environments and prospered to the level of our civilization. Their actions shaped and reshaped their/our neurobiology to the level that we are today in a process that can be described as *dialectical constructivism,* which I will elaborate further. Thus, these processes of several interactions between biology and behavior, mind and brain and genetics and environment, may be described as a *multilevel complexity-based dialectical constructivism.*

Dialectical constructivism, which is rooted in the contextualist metaphor, emphasizes the construction of new structures inside and/or outside the organism based on a synthesis of the interaction between organism and environment (Moshman, 1982). It is defined as an integrative epistemological perspective that encompasses exogenous constructivism (social learning theories) and endogenous constructivism (Piagetian theory), as they became latent frameworks for the understanding of the ongoing process of dialectical synthesis (Greenberg & Goldman, 2019; Moshman, 1982). This perspective suggests that humans develop and elaborate views of themselves and the world based on the interplay between crystallized cognitive-affective structures and moment-by-moment experience through a dialectical relationship between sensory/perceptual and symbolic/logical information. This may also be related with the assimilation and accommodation processes defined by Piaget (1936). Assimilation concerns the retention

of information on pre-existing cognitive structures. Accommodation concerns the transformation of pre-existing cognitive structures into new structures which are more adapted to the environment. Piaget (1936) had an organismic perspective of human development, wherein individuals were able to change the environment (assimilation) and were changed by the environment (accommodation), through a dialectical process.

These perspectives and worldviews are dependent on the interaction between neurobiology with learned, developed, and elaborated cognitive-affective structures (e.g., schemas) that support axiomatic beliefs, cultural values, interests, and life goals. Moreover, the development of these worldviews (dialectical synthesis process) is also embedded in each context in each stage of life (Erickson & Erickson, 1997). As an example, an emotionally deprived child may attribute to himself the guilt for being neglected by his/her parents, due to a temperamental trait of neuroticism (Grawe, 2007; Panksepp, 1998; Siegel, 2012), in a context of a sensitive period where his/her attachment needs were focused on his/her parents. But now, as an adolescent, his/her attachment needs are focused on peers and friendships, and if they do not satisfy their psychological needs, he/she may attribute this fact to the unavailability of those peers/friends. This means that his/her attributions changed due to the stage of life and context, which implies a dialectical synthesis within a different self-narrative due to differences in the life context and stages. That is why a *multilevel complexity-based dialectical constructivism* may be regarded as an alternative perspective to describe these complex interactions that also shape neural networks and human experience.

Greenberg and Pascal-Leone (2001) elaborated on a sequence of dialectical moments framed in five levels of processing, based on a dynamic synthesis of output: automatic action processing, affective processing, executive choice processing, conscious effortful processing, and conscious experience/performance processing. Level one

concerns the unconscious process of selection which produces perceptual/motor experience. Level two concerns affective processing based on an implicit choice on the stimuli articulated with organismic motivations/ or goals. The affective goal activates executive procedures (e.g., choices, plans, directions, intentions), which can be more saturated on consciousness processing (level 3). Finally, level four (effortful processing and effortful choice) and level five (final experience/performance) are the final steps of the schema processing which gives rise to a new personal meaning framed in a new/previous schema - see Figure 1.
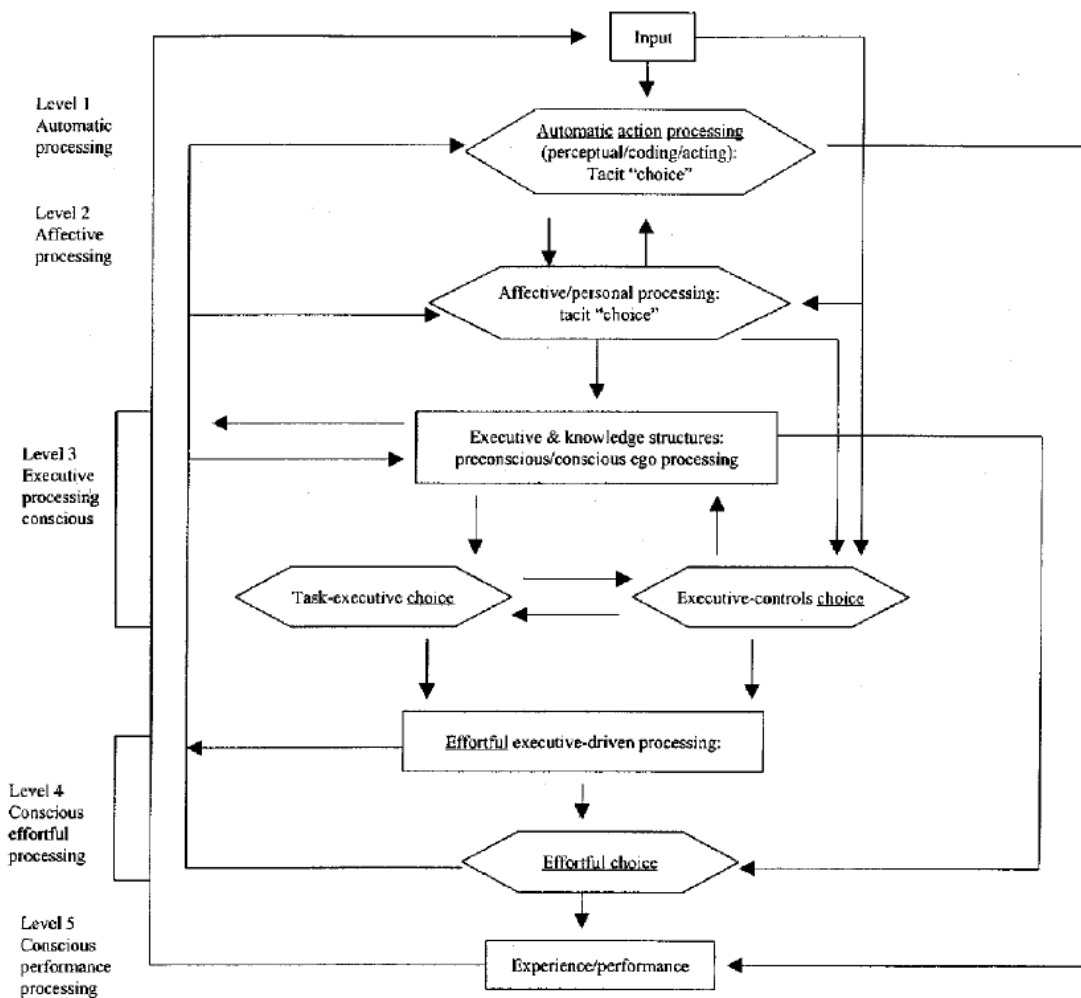
Figure 1. Schematic representation of a dialectical meaning making process. (Adaptive from Greenberg & Pascal-Leone, 2001).

Humans are the product of the interaction between genetics and environment and very early in human development, innate features and learning behaviors interact promoting sets of clusters of interactions that start to shape how neural networks will support and sustain affect regulation and attachment (Cozolino, 2017; Panksepp, 1998; Siegel, 2012), emotions, memory and behavioral process (Cozolino, 2017; Greenberg & Goldman, 2019). For instance, a boy may start to cry because his mother is not paying attention to him (need for attachment and attention). When the mother hears him crying, she holds him, giving care and physical contact, which soothes and calms him. What happens in a situation like this is that a core emotional need, which is neurologically determined and selected by evolution (secure attachment), emerged in the flow of consciousness, and the baby starts crying as a way to call his mother. If his mother attends to him, he will be satisfied and feel a sense of relief which is a manifestation of the satisfaction of a core emotional need (Young et al., 2003). Therefore, this boy will learn that the behavior of crying will call his mother who will adequately satisfy his needs. These learnings will reshape previous neural architecture and will stay encoded in several complex neural networks ranging from orbitofrontal cortex to the hippocampus, cingulate cortex, and accumbens nucleus (Cacioppo & Freberg, 2013; Cozolino, 2017; LeDoux, 2012). This is an example of how an emotional experience becomes an outcome of a complex synthesis of several interactions from basic neurobiology to higher psychological domains that are the building blocks of human development and personality (Cacioppo & Freberg, 2013; Cozolino, 2017; Grawe, 2005; Greenberg & Goldman, 2019; Panksepp, 1998; Siegel, 2012). This idea will be elaborated further in chapters 2 and 4, but this example is a representation of why a dialectical constructivist view of human phenomena may account for the complex interactions between genes and the environment.

Neurogenesis later in human life supports the notion of the implications of a neuroscience perspective in human adaptation. On the dentate gyrus of the hippocampus, researchers found the generation of new neurons in humans, which was unexpected (Boldrini et al., 2018). Neurogenesis, which is the formation of new neurons, was thought only to occur during development of the nervous system. However, this is not the case. The human cortex can generate new neurons which may be associated with the development of new memories, new skills and allow for the expression of new perspectives about the self and others expressed contextually (Dranovsky et a., 2011). Thus, these processes clearly overlap with what is promoted in psychotherapy and support the notion that a neuroscience perspective of human behavior transcends a formist perspective due to the reciprocal role between brain and psychological process – brain influences psychological processes and behavior, and psychological processes influences the brain. Moreover, Erickson and colleagues (2011) documented a paradigmatic study, where adults who walked 40 minutes three times a week for a year developed more growing neurons in the hippocampus than the control group. This implies that behavior stimulated neurogenesis, which enhanced the ability to form new memories. The implications to psychotherapy may be profound when it comes to the stimulation of brain activity due to therapeutic tasks (Cozolino, 2010, 2017).

In conclusion, a *multilevel complexity-based dialectical constructivism* was suggested as an alternative view at an axiomatic level to identify and describe human behavior through different levels of explanation. However, it is also important to point out that the need for this updated ontological and epistemological perspective stems from recent theoretical propositions and empirical findings that suggest a closer approximation between mind-brain relationships (Barlow, 2014; Cacioppo & Freberg, 2013; Cacioppo & Bertson, 1992; Cozolino, 2002, 2017; Etkin, et al., 2005; Grawe, 2007; Greenberg &

Goldman, 2019; Kandel, 1998; LeDoux,2012; Panksepp, 1998; Poucinho, et al., 2011; Siegel, 2012). In this sense, it is important to summarize that the new scientific discoveries can be seen *as a call for a neurobiological perspective of psychotherapy*, which is a central aspect of the present work.

c. A call for a neurobiological perspective on psychotherapy

Neuroscience is here to stay. The last two decades showed an exponent interest in the integration of neuroscience into psychotherapy (Javanbakht & Alberini, 2019). The importance of the identification and exploration of the neural correlates of personality and human functioning has reached a spotlight stage and the evidence is accumulating (Cacioppo & Freberg, 2013; Cozolino, 2017; Grawe, 2007; Goldman & Greenberg, 2019; Kandel, 1998; Panksepp, 1998; Siegel, 2012). It is well established that biological and neurobiological constructs, such as epigenetics, mirror neurons, neuroplasticity, default mode-network (DMN), neuronal development, executive functions, or even neurobiological restructuring may play a pivotal role in the understanding of how psychotherapy changes the brain and promotes psychological well-being (Cozolino, 2017; Grawe, 2007; Magnavita, 2010). From an integrative theoretical perspective, I will focus my attention on three main aspects that are fundamental to understanding how neuroscience is changing the way psychotherapists can approach mind-brain relationships.

One major aspect that is congruent with *a call for a neurobiological perspective on psychotherapy* is the development of new methods (e.g., fMRI, EEG, MEG), which allows the exploration of the neural correlates not only pertaining to mental disorders but also to the therapeutic change process (Cozolino, 2002, 2017; Fuchs, 2004). The traditional dualism between mind and brain seems no longer valid based on discoveries

where distinct neuronal structures and neuronal networks are identified as the neurobiological basis of a mental process (e.g., emotions are mainly produced by the limbic system, complex thought is produced in the frontal lobe). However, it is important to understand why it is important to expand the use of contemporary neuroscience methodology into applied psychological science. Why does the combination of these two scientific fields seem so appealing today? At the core, neuroscience explores the mechanistic understanding at a micromolecular and neurobiological level of the brain functioning, while psychotherapy explores the richness and the human internal and external subjectivity that accounts for complex behavior through the clinical method and individual history exploration (Etkin et al., 2005; Cozolino, 2017). It seems that neuroscientists and psychotherapists are focused on similar aspects of human experience, with different approaches or methodologies (Cozolino, 2017). While it can be easy to spot the differences between a cognitive scientist who studies memory processes, a neuroscientist who studies the neurobiological/neurochemical cascades on the hippocampus, and a psychotherapist that helps a patient to recall some past events, it can be argued that all the three are focused on memory. Therefore, the comprehension of the neurobiological basis of complex behavior, and the interconnections between brain processes and the human mind, along with the identification of maladaptive internal and external patterns, may contribute to a more integrated view and knowledge regarding mind-brain relationships (Cozolino, 2002, 2017). Thus, this may also support a paradigm shift in mental health (Javanbakht & Alberini, 2019).

Another major aspect is the application of these new methods to explore psychotherapy outcomes. Neurosciences have presented a set of valid instruments and methodologies to observe neuronal changes resulting from a psychotherapeutic process (Gonçalves et al., 2014; Messina et al., 2016; Poucinho et al., 2011). In this sense, the

effectiveness of psychotherapy has been documented in several investigations, in terms of what had occurred and/or as a result of different methodologies (Barlow, 2014; Mason et al., 2017; Messina et al., 2016; Poucinho et al., 2011). One of the most investigated mental disorders through neuroimaging studies, through different theoretical orientations, has been the spectrum of depressive disorders, namely: Cognitive-Behavioral Psychotherapy (CBT) with Positron Emission Tomography (PET), and Functional Magnetic Resonance (FMR) (Goldapple et al., 2004; Kennedy et al., 2007; Konarski et al., 2009); Interpersonal Psychotherapy (IPT) with PET and TEPS (Broady et al., 2001; Martin et al., 2001); Behavioral Activation (BA) with RMF (Dichter et al., 2009) and Psychopharmacology with TEPS (Letho et al., 2006). In line with this paradigm, the use of electroencephalography (EEG) emerged as a privileged methodology to investigate changes in brain neurophysiology due to psychotherapy (Miskovic et al., 2011; Moscovitch et al., 2011). In this sense, changes in neuronal activity captured by the EEG are assumed to be correlates of changes in brain dynamics resulting from clinical actions and treatments (Miskovic et al., 2011). There is a large amount of research with EEG that documents "positive" effects of cognitive behavior therapy in brain neurophysiology detailed by diagnosis: Obsessive-Compulsive Disorder (OCD) (Andreou et al., 2013), Spider Phobia (Leutgeb et al., 2009), Social Anxiety (Miskovic et al., 2011; Moscovitch et al., 2011), Generalized Anxiety (Saraladevi & Nithiya, 2013); Couple therapy (DuRousseau & Beeton, 2014) and bipolar disorder (Howell et al., 2012). The "positive" effects in terms of EEG are also documented in the POC after an intervention process by Rapid Eye Desensitization (EMDR, Pagani, et al., 2012), Exposure Therapy with a phobia to dentists (Leutgeb et al., 2011; Schienle et al., 2011) and Psychodynamic Psychotherapy in depressive disorder (Buchheim et al., 2016).

The last major aspect that could support a *call for a neurobiological perspective on psychotherapy* is the potential for the development of neuroscience-based psychotherapeutic principles that could be used by psychotherapists to enhance their practice (Cozolino, 2017; Ecker et al., 2015; Ecker & Bridges, 2020; Grawe, 2007; Tryon, 2014). However, despite countless findings, a congruent set of integrated neuroscience and psychotherapeutic principles is still lacking. If the most skillful and prominent psychotherapists were trained neuroscientists, would they be better therapists? Probably not, because they all apply task principles and techniques that are congruent with the psychological mechanism of change, based on their theoretical roots. Thus, some of them have been validated through neuroscientific methods (Javanbakht & Alberini, 2019). I have identified several neuroscience-based principles that, theoretically, can enhance change process in psychotherapy (Faustino, in prep). These principles may be used to enhance psychotherapeutic responsiveness through: (1) promoting interhemispheric communication (put words to feelings), (2) autobiographical memory reprocessing and/or reconsolidation (activation of hippocampus and parietal associated networks), (3) promote external and internal focus modes of processing (activation of Task Positive Networks and the Default Mode Network), (4) promote self-awareness and reflection on cognitive-emotional states (strength cortico-limbic interaction system, bottom-up and top-down processes), (5) promote motivational self-rewards (activation of mesocorticolimbic system), (6) use combination of all these brain-based processes to promote psychological flexibility (integration of cortico-cortical and sub-cortical networks), (7) respect the working memory and executive functioning limit (do not overload patients with different affective landed mental contents to process), (8) modulate new behaviors (activation of mirror neurons in fronto-temporo-parietal networks) and (9) use the consistency principle to enhance neuroplasticity, neurogenesis and epigenetic

mechanisms (Cozolino, 2002, 2017; Faustino, 2021; Ecker & bridges, 2020; Grawe, 2007; Kandel, 1998; Tryon, 2014). These principles are currently under development.

Finally, it is important to emphasize that this project has a *multilevel complexity-based dialectical constructivism* ontological perspective combined with a translational approach that aims to identify and, possibly, translate into clinical practice the main scientific findings related to neuroscience and psychotherapy, through the optimization of case conceptualization, to enhance clinical decision-making. In this sense, it important to explore recent empirical findings that support the transtheoretical and transdiagnostic perspective on mental health.

d. Transtheoretical, diagnostic and transdiagnostic perspectives

Empirical data is conclusive. There is growing evidence that transtheoretical and transdiagnostic approaches represent new lines of clinical and applied research to increase the explained variance on the psychotherapeutic outcome (Lambert & Barley; 2002; Goldfried, 2019; Newby, et al., 2015; Norcross & Goldfried, 2019; Norcross & Wampold, 2018, 2019). From the analysis of the relative weights in the psychotherapy outcomes, it is clear that some variables are more determinant than others and that these variables are common in all theoretical orientations, with special emphasis on the quality of the therapeutic alliance, as well as the patients' and psychotherapists' characteristics (Castonguay & Beutler, 2006; Goldfried, 2019; Vasco, 2005). This evidence lies at the core of the philosophical standpoint of the psychotherapy integration and transtheoretical approaches which are fundamentally concerned with the development of an individualized case conceptualization and clinical decision making tailored to individuals' characteristics, styles of communication, motivational stages, specific schemas, and needs (Faustino & Vasco, 2020a,b,c; Faustino & Vasco, 2021; Norcross &

Goldfried, 2005; Norcross & Wampold, 2019; Prochaska & DiClemente; 1983; Vasco, 2005, 2018).

Norcross and Lambert (2019) documented that 35% of the variance in psychotherapy outcome is not fully identified or explained. However, 60% of the explained variance may be attributed to some identified factors, such as patient variables (30%), therapist variables (7%), therapeutic relationships (15%), intervention methods (10%), and other factors (3%). Recently, Norcross and Wampold, (2019) described several meta-analytic findings divided into levels of evidence regarding elements of the relationship and patient characteristics. A cluster of variables regarding relationship elements that were described as demonstrably effective was: alliance in individual psychotherapy, the alliance in child and adolescent psychotherapy, alliances in couple and family therapy, collaboration, goal consensus, cohesion in group therapy, empathy, positive regard and affirmation, collecting and delivering client feedback. The second cluster of variables that were defined as probably effective was: congruence/genuineness, real relationship, emotional expression, cultivating positive expectations, promoting treatment credibility, managing countertransference, and repairing alliance ruptures, with effect sizes ranging from .13 to .78 (indicating a range from small to large effects) and average of about .50 (indicating a medium effect). Finally, regarding the patient characteristics, Norcross and Wampold (2019) document more inconsistent results. The results were as follows: *attachment style* (d=.35) was considered promising, but there is still insufficient research to judge, *coping style* (d=.60) was considered probably effective, *culture* (race/ethnicity) (d=.50) was considered effective, adapting to gender identity was considered important but not yet sufficiently investigated, therapy preferences (d=.28) were considered effective, *reactance level* (d=.78), was considered probably effective, adapting to *religion and spirituality* (d=.13–.43) was considered demonstrably effective,

adapting therapist *sexual orientation* was considered important but not yet sufficiently investigated, and finally, *stages of change* (*d*=.41) were considered effective. This will be detailed in the fifth chapter.

Moreover, this empirical data suggest that these factors are very robust in explaining and predicting different degrees of variance in psychotherapy, which is consistent with the common factors approach (Norcross & Goldfried, 2005; Norcross & Wampold, 2019). All these variables belong to different theoretical orientations, however, when combined they may increase the probability to explain psychotherapy outcome, with this being at the core of Evidence-Based Practice (EBT, Norcross & Wampold, 2019), which seems to stand on a transtheoretical and transdiagnostic perspective. Thus, all these variables may also be considered transdiagnostic because they all represent psychological constructs that can be described beyond diagnostic criteria, which are being considered for case conceptualization. Furthermore, previous research showed that clinical decision making based on diagnostic criteria explains 2% of psychotherapeutic outcome with Axis 1 disorders. However, when symptomatic severity is introduced on the equation the explained variance based on diagnostic criteria drops to non-significance (Vasco, 2018). Thus, one of the most fundamental skills that a psychotherapist must master is case conceptualization (Dudley et al., 2011; Eells et al., 2011; Magnavita, 2004; Vasco, 2005). Case conceptualization may be defined as a conceptual map for the understanding of the individual's problem, as a descriptive micro-theory about the relationships between the individual's characteristics, needs, components, and contexts, while it translates a coherent and non-static definition of variables and factors, based on adaptation and non-adaptation, allowing the understanding of the organization of the individual, and prescribing forms of intervention contextualized in their characteristics and needs (Eells et al., 2011; Magnavita, 2004; Vasco, 2005). The personalization of a

descriptive and prescriptive theory that allows both clinician and client to make sense of the described and observed phenomenological experience. Case conceptualization is a core instrument in the systematic treatment selection (Butler, 2000). In this sense, case conceptualization should be based on several patient variables regarding adaptive or maladaptive psychological functioning.

Furthermore, to better customize the case conceptualization to an individual's characteristics, it is important that clinicians possess a flexible view over diagnostic and transdiagnostic perspectives, considering their strengths and limitations (Dudley et al., 2011). Disorder-specific models tend to be categorical and specific, favoring the standardized protocols of specific case conceptualization and interventions, which are studied through manualized treatments in Randomized Controlled Trials (RCTs, Barlow et a., 2017). As examples, several meta-analytic studies supported the diagnostic approach, mainly Cognitive Behavior Therapy (CBT) in generalized anxiety disorders (Cuijpers, et al., 2014), anxiety spectrum disorders (Carpenter et al., 2018), anxiety and depression (Cuijpers, et al., 2013; Cuijpers, et al., 2020), group CBT in primary care (Santoft et al., 2019) and posttraumatic stress disorder (PTSD, Mavranezouli, et al., 2020). This evidence suggests that disorder-specific case conceptualizations may have some benefits especially in applying symptom-specific principles and/or technics based on symptom criteria, such as exposure in anxiety disorders, behavioral activation in depression, or even behavioral training on the development of social skills (Beck et al., 2004; Kaczkurkin & Foa, 2015). Further, using cognitive restructuring to deal with anxiety dysfunctional beliefs (disorder-specific) and attitudes (Beck et al., 2004), using affective re-enactment tasks to deal with depressiogenic emotional difficulties (Goldman & Greenberg, 2017) or even imagery rescripting to deconstruct disorder-specific behavioral patterns in PTSD (Hackmann, 2011), may undoubtedly be a crucial option for

several patients. Thus, the present research work takes into account this evidence, and this is why they are described here. However, controversies around diagnostic criteria are well described in the literature and may be summarized as follows: (1) it is based on statistical analysis and not on clinical evidence, (2) it oversimplifies human behavior in categories (formist hypothesis), (3) it may increase the risk of misdiagnosis or overdiagnosis due to excessive co-morbidities (4) it provides labels, which can be stigmatizing, and it lacks an ecological perspective (Karter & Kamens, 2019).

An alternative response to disorder-specific models is the transdiagnostic approach which postulates that individuals share common cognitive, affective, behavior, motivational and neurobiological processes and mechanisms across different disorders (Barlow et al., 2004; Barlow et al., 2017; Norcross, 2011). This approach is focused on the shared processes and mechanisms that underly different psychological disorders, which may be conceptualized as targets to differentiated psychological interventions (Dudley, et al., 2011; Barlow et al., 2004; Barlow et al., 2017). There is a substantial amount of meta-analytic research that supports transdiagnostic treatments for anxiety and depressive disorders in adults (Newby, et al., 2015), anxiety disorders in children (Ewing, et al., 2020), emotion regulation (Sakiris & Berle, 2019) and group therapy in anxiety, depression, and with comorbid personality disorders (Callesen et al., 2019).

Moreover, as stated before, examples of transdiagnostic constructs may be coping styles, reactance, and stages of change (Norcross & Wampold, 2019). However, several other constructs have received empirical support and may be candidates to be considered transdiagnostic, such as early maladaptive schemas (Faustino & Vasco, 2020a,b,c; Faustino et al., 2019), emotional schemas (Faustino, et al., 2020; Lehay, 2012), psychological needs (Faustino & Vasco, 2020a,b,c; Sol & Vasco, 2017; Vasco et al., 2018), cognitive fusion and psychological inflexibility (Faustino, 2020; Faustino &

Vasco, 2020a,b), emotional processing difficulties (Barreira, 2016; Faustino & Vasco, 2020c; Faustino et al., 2019a), emotion strategies and difficulties (Castelo Branco, 2016; Faustino, 2020), metacognition (Faustino et a., 2019a; Wells, 2000) and schema modes (Lobbestael et al., 2011). Notably, all these variables are included in the present work and will be studied within a transtheoretical and transdiagnostic perspective due to recent empirical and clinical evidence. Now, it is possible to identify the fundamental motivations of why those psychological constructs were included in the present work. However, the research specifications regarding these variables will be described and elaborated in subsequent chapters. As stated before, all worldviews have their strengths and limitations and, like Piaget's perspective, they can be seen as cumulative, where complex worldviews encompass elements of the later (Vasco et al., 2018).

Finally, empirical data supports a transtheoretical approach with both diagnostic and transdiagnostic perspectives. Both have valences that can be used to customize and adapt the case conceptualization and psychological treatment (or responsiveness) to client characteristics, styles of communication, stage motivations, specific schemas, and needs (Faustino & Vasco,2020a,b,c; Norcross & Goldfried, 2005; Norcross & Wampold, 2019; Prochaska & DiClemente; 1983; Vasco, 2005, 2018). Nevertheless, the present doctoral thesis may also contribute to the introduction of other variables regarding patients' characteristics, such as schemas, states of mind, needs, mental skills, and neurocognitive domains, which would help to explain, to some extent, the shared variance of psychotherapy outcome.

Concluding thoughts

The first chapter of this project aimed to describe the main motivations for the development of this work. It was focused on the establishment of the philosophical and

ontological perspective. First, it emphasized the problem of the development of an metatheoretical and multidimensional approach to human complexity (biology and psychology), emphasizing three principles (*multiple determinism, nonadditive determinism* and *reciprocal determinism)* as a possible solution. Second, an articulation of these principles with several worldviews fostered a new ontological perspective called "*multilevel complexity-based dialectical constructivism"*, which articulates those principles and the dialectics between biology and psychology according to different levels of explanation/abstraction (molecular, neuronal networks, mind, behavior and contexts) and through life stages. Third, this perspective was fostered through several neuroscientific findings that supports the integration of neurobiological findings into psychotherapy tasks. Finally, a flexible stance between transtheoretical, transdiagnostic and diagnostic perspectives was outlined based on several research findings.

2. *Towards an integrative disorder theory*

In the first chapter, a comprehensive philosophical and ontological basis was described to illustrate the need for a new integrative and metatheoretical framework based on flexibility across different worldviews. A call for a multidimensional approach between psychotherapy and neuroscience was outlined as a foundational basis for the understanding of different developmental processes, regarding complex interactions and acquisitions of human psychological structures. These variables may also be predisposing and precipitating (vulnerability factors) to the development of emotional suffering and/or psychological disorders.

Towards an integrative disorder theory is the second chapter, which will be focused on four topics: (1) environmental and genetic interactions, (2) early toxic experiences, trauma, and dissociation, (3) parenting styles, temperament, and contextual factors and (4) frustration of core emotional needs. Thus, these variables may also be viewed as predisposing or precipitant factors or vulnerability to the development of psychological disorders.

Environmental and genetic interactions comprise a set of complex phenomena which are the essential blocks for human development and maturation. Recent findings showed that different mechanisms account for the shared variance of genotype and phenotype expressions across different aspects of human personality, such as temperamental traits and neurocognitive functions (Cloninger et al., 2019; Hernandez & Blazer, 2006; Plomin et al., 2017).

Early toxic experiences, trauma, and dissociation lie at the core of psychopathology in different theoretical orientations (Barlow, 2018). Individuals who suffer from repeated early toxic experiences tend to manifest trauma-related symptoms and dissociation in

adulthood and have lower levels of adaptive psychological functioning (Cozolino, 2017; Grawe, 2007).

Parenting styles, temperament, and contextual factors play a central role in the acquisition and maintenance of psychological distress and disorders. Research has consistently shown that these variables are associated with the development and maintenance of psychological disorders (Cloninger et al., 2019; Gonda et al., 2020; Zwir et al., 2019). Finally, all these topics will be contextualized on the *evolutionary neurobiological motivations and the regulation of core psychological needs,* which may be viewed as the cornerstone of mental health (Faustino & Vasco, 2020a, b, c; Vasco et al., 2018). Towards an integrative disorder theory lies the notion that environmental and genetic interactions, early toxic experiences, trauma, and dissociation, parenting styles, temperament, and contextual factors shape how individuals learn to regulate their psychological needs. Therefore, a clear conceptual model will be described.

a. Gene-environment interplay and human development

The old debate is still ongoing, and it is here to stay. The complexity of human conception, development and maturation is one of the most challenging aspects of psychological and biological sciences. Traditional perspectives on the nature vs nurture debate assumed that the variation in human traits is categorically due to either environmental or genetic differences. However, contemporary findings are seeing the light of the day monthly. Updated scientific data shows that both environmental and genetic differences are discretely responsible for phenotypic manifestations and variations and that, fundamentally, all traits are influenced by these two factors (Cloninger et al., 2019; Hernandez & Blazer, 2006; Knopik, et al., 2017; Ridly, 2003).

Behavioral genetics research has a widespread impact on the understanding of the involvement of gene-environment interplay in producing behavior (Knopik, et al., 2017). One of the most significant findings within this scientific field is that almost all researched behaviors may have a significant amount of the variance explained by genetic factors, and that influence may increase with age (Knopik, et al., 2017; Plomin et al., 2017). Evidence shows that a very large number of genes are responsible for human behavior, but these genes produce very small individual effects, which means that they must interact between them to manifest a specific phenotype and, possibly, environmental influences play a determinant role in these interactions and expressions (Dick, 2011). To understand how these interactions occur and how these interactions may support phenotypic variations and individual differences, it is important to explore two different types of gene-environment relationships: gene-environment interaction and gene-environment correlation.

Gene-environment interaction (GxE) is a concept used to describe the phenomenon of the dependency effects of genes on the environment and/or the dependency effects of the environment on genotype (Dick, 2011). This notion implies that individuals have genetic sensitivity, or susceptibility to the environment which contributes to individual variability of phenotypes (Knopik, et al., 2017). One well-documented model that uses this notion to explain psychopathology is the *diathesis-stress* model (Zuckerman, 1999). This model states that individuals who have genetic risk or predisposition for psychopathology are extremely vulnerable to environmental stressors (Knopik, et al., 2017). For instance, individuals who score high on neuroticism tend to manifest higher levels of depression and interpersonal conflict (Jaffee & Price, 2012), which means that this personality trait may be a genetic temperamental disposition for symptomatology. Another example is that of an individual who has a genetic vulnerability

for schizophrenia, who is more likely to manifest psychotic symptoms when confronted with life stressors (e.g., loss of a parent, friend, or unemployment) than individuals who lack a genetic vulnerability for schizophrenia (Cannon et al., 1990; Malaspina, 2001; Moldin & Gottesman 1997). Further, recent research showed that GxE may be found in several clinical disorders (Assary et al., 2018; Caspi et al. 2002, Cadoret et al. 1990; Heston & Denney 1967; Wahlberg et al. 1997) and in maladaptive personality traits (Burt, 2008; Jaffee & Price, 2012), which supports the notion that genes and environment are important on the development of new integrative etiological models (Dick, 2011).

Gene-environment correlation (rGE) defines a correlation between two traits that covariate by a causal and non-causal mechanism. One main interest in causal mechanism relates to how genetics controls environmental exposure indirectly through behavior (Plomin et al., 1977). Three causal mechanisms were described in the literature. Passive rGE describes the correlation between a genotype of an individual who passively inherited it from his parents and the environment where he/she is created. One example may be given. Parents who have histories of antisocial behavior tend to be at risk for abusing their children and to develop a violent environment at home (Gottesman, 1991). Evocative rGE describes the correlation between individuals' genetic propensities and the evoked reactions from other people based on these propensities. A good example may be that gifted children may receive special attention or opportunities in school (Knopik et al., 2017). Active rGE occurs when individuals possess genetic propensities that set the path for environmental exposure. One example is that individuals who are extroverts seek different social situations than individuals who socially withdraw (Jaffee & Price, 2012).

Moreover, behavioral geneticists explore rxE and rGE through different methods. Family studies, adoption studies, twin studies, and DNA studies are typically used to explore GxE. To explore rGE, typically, correlational and multivariate comparative

methods are used. Family studies have established that similarity between family members is related to shared genes and the environment (Hicks, et al., 2013). Several family studies established the contribution of GxE in schizophrenia (Cannon et al., 1990; Malaspina, 2001; Moldin & Gottesman 1997). Adoption studies were also important in established the contributions of GxE in schizophrenia (Heston & Denney 1967; Wahlberg et al. 1997), depression (Cadoret et al. 1990; Kendler & Prescott, 1999), and personality traits (Burt, 2008). Twin studies also show the genetic influences on alcohol consumption (Rose et al. 2001) and antisocial behavior (Button et al., 2007). Further, recent molecular analysis based on the collection of deoxyribonucleic acid (DNA) have deepened the understanding of GxE at a molecular level, especially in detecting functional genetic polymorphisms (Dick, 2011). With this technique, it was possible to identify the moderation effect of the monoamine oxidase A (MAOA) on the relationships between maltreatment and antisocial behavior in men (Caspi et al. 2002), and the moderation effect of the serotonin transporter gene (5-HTT) on the relationship between stressful life events and depression (Caspi et al. 2003). Also, molecular studies have associated the dopamine receptor D4 gene (DRD4) with attention deficit hyperactivity disorder, the catechol-O-methyltransferase (COMT) with schizophrenia, and the brain-derived neurotrophic factors (BDNF) with bipolar disorder, depression, and schizophrenia (Assary, et al., 2018).

The interplay between gene and environment has a profound impact on how personality psychology approaches the development of human personality. It is widely assumed that human personality may be divided into two major domains: temperament and character (Cloninger & Cloninger, 2011; Cloninger, et al., 2019; Fountoulakis & Gonda, 2019). Temperament may be viewed as the expression of genetic predispositions and character may be regarded as the environmental aspect of personality, which is based

on life experiences, learning, social contexts, and cultural beliefs and/or expectations (Cloninger, et al., 2019). Nevertheless, there are many different forms to conceptualize human personality, which are beyond the scope of this work, but a recent study may shed some light on the gene-environment interplay on the development of temperament, which is a fundamental variable in the present study. Cloninger and colleagues (2019) described in several genome-wide association studies (GWAS) that temperament is strongly modulated by more than 700 genes with associations on associative conditioning through the process of synaptic plasticity and long-term learning and memory. These genes were enriched by two major molecular pathways (Ras-MEK-ERK and the PI3K-AKT-mTOR cascades), which were activated by physiological and psychosocial stimuli (positive and negative emotional valence), which were linked to cellular homeostasis despite affective temperamental modulations. Thus, affective temperament has a strong basis on genetics and heritage (Buss & Plomin, 1975) and there is some evidence for those assumptions through a correlation study where the dopaminergic transmission modulated by COMT was associated with cyclothymic and irritable dimensions of affective temperament (Lesiewska et al., 2019). Moreover, these results illustrate the expression of GxE in temperament at different levels of analysis, from a psychological to the molecular level.

Several studies have also explored the relationship between GxE and the neurocognitive processing. Several twin studies showed that executive functions and working memory have a strong heritage (Blokland et al., 2011; Panizzon et al., 2014) and that there is a genetic correlation between a generic executive function factor and the intelligence coefficient (Friedman et al., 2008). Multivariate genetic twin analyses have also described correlations between magnetic resonance imaging (MRI) data of brain structure and general cognitive ability and suggested that these correlations may have a strong genetic component (Betjemann et al., 2010; Hulshoff Pol et al., 2006; Schmitt et

al., 2007). Also, Chiang et al., (2009) found strong correlations between brain connectivity heritability and cognitive abilities. Despite these robust findings regarding genes on neurocognition, some studies showed the impact of the environment on cognition. Deary et al. (2006) suggested that the effect of shared environmental impacts on cognition tends to decrease across time. However, the same cannot be said regarding non-shared environmental features which are fundamental to overall cognitive abilities (Tucker-Drob et al., 2013). Petrill and Deckard, (2004) through a family adoption study showed that the cognitive abilities of mothers were correlated with their biological children ($r= .23$) rather than adopted ones ($r= −.03$). Avinun and Knafo (2014) showed that genetic influence is driven through a child's traits, which predispose him to express different phenotypes. These findings highlight the influences of a non-shared environment on neurocognition.

However, despite this evidence of the contribution of gene polymorphisms on human behavior, it is important to give emphasis to a recent paper published by Plomin, and colleagues (2017), which described the 10 important replications in psychological science, regarding behavioral genetics. Two major conclusions were that "*all psychological traits show significant and substantial genetic influence*" (finding 1) and that "*no traits are 100% heritable*" (finding 2). These findings emphasize the interaction between genes and the environment in shaping human psychological traits. Thus, Shanahan and Hofer (2005) suggested that social context moderates the expression of genetic effects through four processes: (1) environment may *trigger* a genetic predisposition, (2) environment may *compensate* a genetic predisposition, (3) environment may *control* a genetic predisposition, (4) environment may *enhance* a genetic predisposition. These processes may contribute to the under or overexpression

or/and modulation of different traits with implications for how the individual manifests individual differences in affective temperamental traits, neurocognition, and behavior.

Furthermore, a brief view of the gene-environment interplay and human development was described. The main goal was to establish the importance of an integrative view on how these two fundamental domains shape human psychological traits and neurocognition, which are the core aspects of this research. The importance of GxE and rGE findings to understand how genes and environment interact to manifest different phenotypes, which are the fundamental basis for individual differences, was emphasized. It is important to state that genes and environment have differential weights on how individuals deal with life and how they cope with early life experiences, trauma, and dissociation, which is the subject of the next subchapter. Genes and environment shape how individuals experience their emotional suffering and cope with dissociative symptoms which tend to manifest across the lifespan (Cozolino, 2002, 2017). Several theoretical orientations regard early toxic experiences, trauma, and dissociation as the basis of psychopathology. This work is aligned with this view, but it takes a more inclusive and integrative perspective. Finally, if we take a road *towards an integrative disorder theory,* a multidimensional and informed view on gene-environment interplay must be a foundational block within the conceptual framework.

b. Early toxic experiences, trauma, and dissociation

The interaction between individuals' genetic predispositions or temperament and early environments sets the stage for new learning experiences which tend to become the foundational blocks for personality development. Traumatic early environments tend to foster emotional suffering, maladaptive learnings, and problematic psychological process, (e.g., dissociation, avoidance, subjugation). These processes became stable

during life time creating risks for diverse mental disorders and physical health (Lyssenko, et al., 2018; Shonkoff & Garner, 2012; Hughes et al., 2017). Thus, early toxic experiences, trauma, and dissociation lie at the core of psychopathology in different theoretical orientations (Dimaggio et al., 2015; Freud, 1923; Vasco et al. 2018; Young, et al., 2003), which may support these psychological constructs as core candidates for an integrative disorder theory.

Early toxic experiences may be defined as the set of prolonged and repetitive interactions and experiences between children and their early environment, which are maladaptive, which tend to occur daily, and which occur with the absence of nurturance and support from a caregiver (Franke, 2014; Shonkoff & Garner, 2012). Deeply connected with early toxic experiences is childhood trauma, which can be defined as the experience of an event that causes distress, emotional suffering, and psychological pain, and which tends to foster lasting cognitive, emotional, relational, and physical dysfunctional effects (Pearce et al., 2019). Children who are exposed continuously to stressful agents (e.g., parents, peers, school groups) and to early toxic environments in a repetitive way tend to develop maladaptive schemas and coping skills (e.g., dissociation), poor stress management, dysfunctional lifestyles, and diverse psychopathological symptomatology and mental disorders (Dimaggio et al., 2015; Franke, 2014; Felitti et al., 1998; Lyssenko, et al., 2018; Humphreys et al., 2020; Shonkoff & Garner, 2012; Young et al., 2003). Thus, childhood trauma has a severe impact on how individuals learn to frustrate or satisfy their emotional core psychological needs through the entire life (Vasco et al., 2018; Young et al., 2003). I will further elaborate onthis issue in chapter 3.

According to the American Academy of Pediatrics (AAP, 2014), a toxic early environment may promote different adverse childhood experiences, such as emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect, maltreatment of

the mother, household substance abuse, household mental illness, parental separation or divorce and incarceration of a household member. Previous research showed that different early toxic experiences and trauma may be related to different outcomes. Thus, several recent meta-analyses described close relationships between early bullying and risk for psychotic symptoms (Peh, et al., 2019), between physical, emotional or sexual abuse and physical neglect and suicidal attempts (Zatti et al., 2017), between child maltreatment (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect) and depression (Humphreys et al., 2020), and between childhood physical and sexual abuse and reoffending (Dalsklev, et al., 2019). Also, childhood trauma has been associated with poor neurocognition, psychosis, emotional neglect, emotional abuse, physical abuse and with major depressive disorder (Struck et al., 2020), and emotional abuse/neglect has been associated with dissociation (Vonderlin et al., 2018). Moreover, childhood trauma has been also associated with diverse personality disorders (Bierer et al., 2003; Struck et al., 2020; Tyrka et al., 2009) and borderline personality disorder (Khosravi, 2020).

Dissociation is closely related to early childhood trauma, as robustly evidenced by research (Vonderlin et al., 2018). Dissociation is defined as a disruption, discontinuity, block, and/or derailment of the habitual integration of several mental processes such as cognition, perception, memory, motor control, and behavior on identity and consciousness (Diagnostic and Statistical Manual of Mental Disorders 5, 2013). When individuals experience severe trauma, they tend to manifest symptoms of depersonalization, derealization, numbness, apathy, or existential emptiness, because of the deeply dysfunctional emotional impact of trauma on the flow of consciousness, which disrupts the normal integration of that painful experience with the self. Traumatic experiences are more than the individual's cognitive-affective system is able to cope with.

In this sense, the disintegration of cognitive, emotional, somatic and behavioral domains occurs as a consequence of the painful experience, which is felt as overwhelming.

From a neurobiological perspective, early life experiences have a huge impact on brain development (Siegel, 2012). Repeating relational experiences shapes undifferentiated neurons into coherent firing neural networks that support cognitive-affective structures (Grawe, 2007; Siegel, 2012). In this sense, traumatic and dysfunctional early life experiences are encoded in neural systems between the amygdala and the brain stem, which are strengthened by repetition and biases (Cozolino, 2017; Siegel, 2012). Therefore, this mechanism may explain why trauma and dissociation may have a severe pervasive effect on personality development (Cozolino, 2017; Grawe, 2007). Because dissociation tends to fragment neural networks (Cozolino, 2017), these dysfunctional experiences stay embedded in the subcortical structures, without the modulation of cortical structures which are essential for identification, differentiation, and integration of adaptive meanings to experience. In this sense, later in life, individuals may be unaware of what are his/her underlying dysfunctional themes, which cause emotional suffering based on those dysfunctional early experiences. This may also have pervasive impacts on neurocognitive processes, such as executive functions, memory, attention and self-referring processing (Cozolino, 2017; Faustino, 2021, Grawe, 2007; Siegel, 2012).

Furthermore, dissociation has also been associated with borderline personality disorder (Mosquera & Steele, 2017), dissociative identity disorder (Dell & O´Neil, 2009), posttraumatic stress disorder (Burton et al., 2018), and depressive/anxiety disorders (Prasko, et al., 2016), which means that it is associated with different psychological disorders. This may indicate that dissociation may be defined as a *dysfunctional acquisitional mechanism* – core psychological processes and mechanisms related with

disorder development and maintenance (see theoretical integration chapter for details). Therefore, based on this evidence, dissociation may be regarded as a core dysfunctional psychological mechanism in the formation of maladaptive schemas, modes and states of mind, which may underlie this integrative disorder theory. According to Young and colleagues (2003), dissociation is a mechanism that fosters the formation of schematic modes, which are very similar to the concept of states of mind covered in this research (see chapter 3, for details). Therefore, dissociation acts as a core dysfunctional mechanism that may fragment the self and create dissociated self-parts, domains, facets, or modes with diverse states of mind. In this research, dissociation will not be directly assessed directly (see limitations and future direction section for details). However, it was described due to its hypothesized function in this integrative disorder theory. Finally, it is noteworthy to emphasize that toxic experiences, trauma, and dissociation interact closely with affective temperament, parenting styles, and contexts in the development and maintenance of psychological disorders (Van der Kolk, 2005).

c. Parenting styles, temperament, and contextual factors

Other factors may contribute to the development and maintenance of psychological disorders. Thus, it is the interaction between genes and environment at molecular, neurobiological, cognitive, emotional, interpersonal, and behavioral levels that underlies psychological vulnerability (Cozolino, 2007, Knopik, et al., 2017). The understanding of the contribution of parenting styles, temperament, and contextual factors in the development and maintenance of psychological disorders has increased due to the combination of different research paradigms, such as clinical psychology (Baumrind, 1991; Perez-Gramaje et a., 2019), neuroscience (Guyer et a., 2016) and psychiatry (Cloninger, et al., 2010; Gonda et al., 2020).

Parenting styles are defined by the multiplicity of parent's attitudes and behaviors regarding their children and the emotional tone in which those parents' attitudes are manifested (Darling and Steinberg, 1993). Baumrind (1991) defined four parenting styles based on responsiveness and demandingness: authoritative (high in responsiveness and demandingness), authoritarian (low in responsiveness but high in demandingness), indulgent (low demandingness but high in responsiveness), and neglectful (low in responsiveness and demandingness). These styles have been studied for several decades and research has shown how these parenting styles impact several psychological variables associated with personality functioning.

Eisenberg (2005) described that a positive/authoritative parenting style is associated with adaptive levels of self-regulation. Guyer and collaborators (2015) documented that behavioral inhibition (temperamental trait) is positively correlated with an authoritative parenting style. Recently, Madeline (2017) found that authoritarian and permissive styles are correlated with low self-regulation and authoritative style is positively associated with enhanced self-regulation. Self-regulation may be viewed as a core acquisition that children need to acquire to exert some form of regulation in cognition, emotion, behavior, and interpersonal domains. Moreover, dysfunctional parenting styles are associated with early maladaptive schemas (Esmali Kooraneh & Amirsardari, 2015), depression (Gibb et al., 2003; McLeod et al., 2007), maladaptive coping modes in eating behaviors (Brown et al., 2016), lower levels of self-regulation (Newman, 2017), inadequate social-emotional development (Shaffer &K Kipp, 2013) and maladaptive personality development (Baumrind, 1991; Basso et al., 2019). These evidences expresse the close associations between parenting styles and core psychological variables.

A child's innate temperament is another major variable that may contribute to the development and maintenance of psychological disorders (Young, et al., 2003), as is shown by research. Temperament may be defined as a set of complex individual predispositions, genetically determined, which are responsible for internal and external adaptations to environmental demands (Cloninger, 2013). One major temperamental trait that is extremely important to psychological wellbeing is the affective temperament (Akiskal et al., 2005). Young and colleagues (2003) state that emotional temperament interacts with traumatic childhood experiences in the formation of internal structures (e.g., schemas) to form lifelong intrapsychic cycles that maintain characterological and chronic psychological disorders. When it comes to maladaptive schema formation, emotional temperament interacts with distressful and painful early experiences by exposing the child to specific contextual factors. For example, a child with an active behavioral trait is more likely to elicit strong emotional reactions from an abusive parent than a passive child (Young et a., 2003). A child with a sociable temperamental trait may be more prone to trust in others who may exploit the child in several ways. Alternatively, a child with a distimic affective trait may elicit invalidation, coldness, or emotional avoidance from a neglectful parent. Thus, parenting styles and temperamental traits contribute to family environment (contextual factor).

Li and colleagues (2019) described that several studies documented that, on the one hand, adaptive parenting (e.g., consistent discipline, positive control, monitoring, authoritative parenting and parental warmth and support, associated with a robust parent–child relationship (e.g., secure attachment, high quality of relationship, close parent–child bonding)) is associated with self-control; and, on the other hand, non-adaptive parenting (e.g., harsh parenting, physical punishment, negative control, inconsistent discipline, coercive parenting, authoritarian parenting) associated with weak parent–child

relationship is related with lower self-control during early and middle childhood (Davis et al, 2017; Karreman, et al., 2006; Pallini et al., 2018).

The interaction between these variables has been systematically reported in several meta-analytic studies and several examples may be given. Slagt and colleagues (2016) explored associations between parenting and child adjustment. Data revealed that children with a difficult temperament were more likely to be vulnerable to negative parent behaviors, when compared with children with more easy temperament. Williamson and colleagues (2017) documented a significant association between parenting behaviors and post-traumatic stress disorders (PTST) in childhood, wherein both adaptive and non-adaptive parent behaviors were significantly associated and did not differ statistically in magnitude. Guyer and colleagues (2015) documented associations between affective temperament and parenting styles, where children who score high on Behavioral Inhibition were prone to sensitivity to variance in parenting styles, especially tough parenting behaviors. Li and colleagues (2019) found that parenting is associated with adolescent self-control and that adolescent self-control is also associated with subsequent parenting. Croft and colleagues (2019) reported associations between trauma, age of exposure and frequency and the risk of psychotic experiences in early adulthood. The authors state that trauma was related with psychotic experiences in all ages. However, the adolescence was the age period in which trauma was strongly correlated with psychotic symptoms. Finally, Cyniak-Cieciura and Zawadzki (2019) described associations between trauma and affective temperament, with moderate and weak associations between temperament traits (e.g., emotional reactivity) and PTSD symptoms. These findings support the assumption of the close relationships between temperament, parenting styles and contextual factors on differential developmental trajectories (adaptive or maladaptive). Therefore, these variables are included in the present work.

d. Evolutionary neurobiological motivations and the regulation of core psychological needs

The human mind and behavior are driven by a systematic and complex set of different basic needs and motivations which modulate internal and external action tendencies towards intrapsychic balance. Different learnings, experiences, traits, underdeveloped skills, and external constraints may disrupt the required flexibility to optimal psychological and neurological functioning. A closer look at the literature reveals that several authors tried to capture the notion of *internal or external physiological and neurobiological drives, pressures, or energies that synthesize a disruption of organismic homeostasis, which manifests psychologically on a conscious level, being processed by the reflexive and/or automatic processing system, regardless of the context.* These *pressures* were selected by evolution through several emotional and relational adaptations (Buss, 2004, 2011). In this sense, the integrative potential of the construct of core human motivations and needs may be a theoretical option to capture the concept of those *disruptions that imply internal drives and pressures.*

The fact that humans are driven by basic internal needs and motivations leads to different conceptual theories rooted in different theoretical orientations, showing the importance and the centrality of this concept to psychologists. Therefore, a diverse taxonomy of constructs is available, such as primary and secondary needs (Murray, 1938), the pyramid of needs (Maslow, 1954), basic affective states (Panksepp, 1998), core emotional needs (Young, et a., 2003), interpersonal motivational systems (Liotti, 2001), need for consistency (Grawe, 2007), personality drives (Beck et al., 2004), psychological needs (Sheldon et al., 2001) and the regulation of psychological needs (Vasco, et al., 2018). Also, several different theories encompass the notion of human core needs, namely, sexual drive theory (Freud, 1905), cognitive-experiential self-theory (Epstein,

1993, 2003), self-determination theory (Deci and Ryan, 2000), motivational personality theory (Millon, 1990) and polarity of experience of personality theory (Blatt, 2008). Moreover, several similar constructs may also be linked to the notion of needs, such as psychosocial stages (Erickson, 1963), social mentalities (Gilbert, 2005), or life themes (Veglia & Di Fini, 2017).

Across these concepts and theories, several needs are repeated multiple times, such as attachment (Bowlby, 1982, Maslow, 1954, Grawe, 2004, Young et al., 2003; Liotti, 2001), autonomy (Grawe, 2004,Liotti, 2001; Deci & Ryan, 2000; Young et al., 2003), self-worth/esteem (Maslow, 1954; Grawe, 2004; Liotti, 2001; Deci and Ryan, 2000; Young et al., 2003), play and spontaneity (Grawe, 2004, Young et al., 2003) and meaning (Erickson, 1963; Maslow, 1954; Young et al., 2003). Moreover, some principles and processes regarding human needs may also be listed, such as the consistency principle (Grawe, 2007) and the polarity of needs (Blatt, 2006). The consistency principle postulates harmonious compatibility between different intrapsychic processes and mental states (Grawe, 2004). The polarity of needs principle states that psychological growth emerges from the synthesis of dialectical polarities of different needs (Blatt, 2008).

Based on all these concepts, principles, and empirical research, a new integrative concept of psychological needs was elaborated to identify, describe, and explain the human experience (Vasco, 2001, Vasco, 2005, Vasco et al., 2018). According to Vasco et al., (2018), psychological needs are defined as states of organismic disequilibrium by excess and/or lack of psychological nutrients, signaled emotionally, which promotes internal and external actions focused on the restoring of psychological balance. The emotional system is the one that signals the degree of regulation. Thus, emotions need to be attended to, identified, validated, and accepted for an individual to understand which psychological need is over or under-regulated (Faustino & Vasco, 2020c). Psychological

needs are never fully satisfied due to the ongoing negotiation between several dialectical polarities. (Vasco, 2001, Vasco, 2005, Vasco et al., 2018). Based on several years of research, Vasco et al., (2018) state that there are fourteen psychological needs organized in seven dialectical polarities which are responsible for psychological well-being and life satisfaction, namely: *pleasure/pain*; *proximity/differentiation*; *productivity/leisure*; *control/ cooperation*; *actualization/tranquility*; *self-coherence/incoherence* and *self-esteem/self-criticism* (Vasco et al. 2018). Thus, the regulation of psychological needs is viewed as the cornerstone of mental health, and this assumption has received some empirical support (Barreira, 2016; Conde, 2012; Faustino & Vasco, 2020a,b,c,d; Fonseca, 2011; Sol & Vasco, 2012; Vasco & Vaz-Velho, 2010).

The diversity of concepts of universal human core needs may represent the awareness of the centrality of internal needs and motivations on personality development and growth through different life stages. However, this may also be due to the shared neurobiology and evolutionary pressures that humans suffered through evolution. Epigenetic mechanisms can reshape different phenotypes that have been refined, whose need or motivational goal has passed through generations (Buss, 2011; Cozolino, 2017; Siegel, 2012). However, despite these claims, the research on the neurobiology of psychological and motivational needs is still in its infancy. Sullivan (2012) described the complex neurobiology of attachment, which involves the development of the HPA axis and reward system from an early age, accompanied by the development of the amygdala, hippocampus, and the prefrontal cortex. Eisenberger et al. (2003) reported significant correlations between the dorsal anterior cingulate cortex (dACC) and the anterior insula (AI) and lower state self-esteem. This was the first study to associate an affective pain neural network to the state of self-esteem. More recently, Reeve and Lee (2019) documented the association between intrinsic satisfaction of autonomy, competence, and

relatedness with subjective feelings, typically associated with the striatum-based reward processing and anterior insula. They concluded that the integration of these feelings was also associated with co-activation of these two brain areas and the reward-based processing system. Romaniuk et al., (2019) studied the neurobiology of perceived control and found that, when individuals anticipated a personal choice, several brain areas were activated, namely, the left insula, cingulate, right inferior frontal cortex, and ventral striatum. However, in participants with subclinical depressive symptoms, the activations in the ventral striatum were diminished. These findings are sparse but may complement the notion of the universality of human core needs and motivations with their neuronal substrates.

As stated before, the regulation of psychological needs has been extensively studied, and empirical data has shown a fair amount of support for theoretical assumptions regarding the regulation of psychological needs, well-being, and mental health. On one hand, research showed that the regulation of psychological needs is negatively associated with dysfunctional variables, such as early maladaptive schemas (Faustino & Vasco, 2020a,b,c; Fonseca, 2012), emotional schemas (Faustino & Vasco, 2020d), interpersonal dysfunctional cycles (Faustino & Vasco, 2020a, Martins, 2016), psychological inflexibility (Faustino & Vasco, 2020a), emotional processing difficulties (Barreira, 2016; Faustino & Vasco, 2020c), emotion dysregulation (Castelo-Branco, 2016), defensive styles (Martins, 2016), alexithymia (Fonseca, 2012), psychological distress (Faustino & Vasco, 2020a; Barreira, 2016; Martins, 2016; Sol & Vasco, 2012) and symptomatology (Faustino & Vasco, 2020a; Sol & Vasco, 2012). On the other hand, research showed that the regulation of psychological needs is positively associated with psychological well-being (Faustino & Vasco, 2020a; Castelo-Branco, 2016), emotion

regulation (Castelo-Branco, 2016), metacognition (Gonçalves, 2020), and life satisfaction (Sol & Vasco, 2017).

This research establishes the regulation of psychological needs as a core aspect of mental health and supports its inclusion as a foundational component of this work. However, this research intends to fully explore the proposed model of a disorder theory. Single relationships between described variables can be found in several meta-analytic studies, such as trauma and early toxic experiences (Holman, et al., 2016), trauma and parenting styles (Williamson et al., 2017), trauma and affective temperament (Cyniak-Cieciura & Zawadzki, 2019), and affective temperament and parenting styles (Guyer et a., 2015). However, these variables were not studied within an integrative framework to explore their additive value on the explanation of the regulation of psychological needs. Therefore, the main contribution of this work is to explore the additive value of traumatic early life experiences, affective temperament, and parenting styles on the regulation of psychological needs.

Concluding Thoughts

Why it is that psychological needs may lie at the core of psychological disorders and symptomatology? As stated in the beginning, humans are driven by a complex set of different basic needs and motivations which modulate internal and external action tendencies towards intrapsychic balance. Different learnings, experiences, traits, underdeveloped skills, and external constraints may disrupt the required flexibility to optimal psychological and neurological functioning. Therefore, an integrative disorder model is required to understand and coherently articulate these processes. Individuals are born with innate genetic features which manifest from an early age in temperamental and affective traits. These individuals are raised in secure or distressful environments that

encompass early complex traumatic experiences which foster maladaptive learnings and dissociation. Early toxic experiences are associated with dysfunctional parenting styles and are mediated by the affective temperament. Based on these experiences, individuals learn to behave in an idiosyncratic manner which tends to replicate those same dysfunctional patterns through their life cycle. This means that they continue to act in a way that frustrates their core emotional needs (Young et al., 2003). Moreover, early toxic experiences, trauma, dissociation, affective temperament, and parenting styles all contribute with an additive level of explanation to the regulation of psychological needs. Put in different words, individuals are born with innate neurobiological needs and tendencies which tend to be frustrated or satisfied within close relationships. Through repeated relational experiences in face of the manifestation of those needs, individuals learn and internalize how to satisfy those needs. Individuals develop core self and interpersonal schemas which encode meanings and predictions regarding the frustration or satisfaction of psychological needs (Young et al., 2003; Dimaggio et al., 2015; Vasco et al., 2018). Different variables can also contribute to these intra and interpsychic cycles and they will be described in further chapters.

*3. **Beyond a single theoretical approach to case conceptualization***

In the second chapter, a rationale *towards an integrative disorder theory,* a coherent and empirically-based disturbance model based on early toxic experiences, parenting styles, temperament, and frustration of core emotional needs, was described. The purpose of this model is to be a foundational coherent and flexible framework to support a transtheoretical model of case conceptualization.

Beyond a single theoretical approach to case conceptualization is the third chapter, where different transtheoretical constructs will be described, with an aim at outlining the core dysfunctional variables which may be included in an integrative case conceptualization. The identified variables are (1) schematic functioning and states of mind, (2) dysfunctional consequences and defensive maneuvers, and (3) mental skills and adaptive processes. These processes were previously theoretically and empirically identified has core mental structures positively associated with symptomatology (Faustino & Vasco, 2020a,b,c; Faustino et al., 2020a), psychological distress (Barreira, 2016; Castelo Branco, 2016; Faustino et al., 2020; Faustino et al., 2020a; Martins, 2016; Sol & Vasco, 2017) and psychological disorders (Arntz et al., 2005; Bamelis et al., 2011; Lobbestael et al. 2008). Each topic will be subdivided into several subtopics, at a low level of abstraction, to better differentiate and organize the theoretical conceptualization.

Diversity of the schematic functioning and states of mind captures the multiplicity of these constructs from different perspectives or theoretical assumptions. The concept of the schema has a long history in psychology and has clear implications in cognitive psychology, clinical psychology, educational psychology, and even neuroscience (Faustino & Vasco, 2020a,b,c; Faustino, 2021). Also, it relates to the notion of states of mind, which may be viewed as a core psychological construct in human experience

(Horowitz, 1989; Siegel, 2012, 2010). In this sense, this topic will be divided into four subtopics: (1) Information processing theory as a unified schema model, (2) early maladaptive and cognitive schemas, (3) emotional schemas and emotional experiences (4) interpersonal and relational schemas and (5) states of mind, schema modes, and the self.

Defensive maneuvers and dysfunctional consequences are the second topic of the third chapter and are related to theoretical and empirical findings of the psychological defenses and consequences that individuals use to cope with, or experience due to the activation of maladaptive schemas and states of mind (Faustino & Vasco, 2020a, 2021; Faustino et al., 2019b; Martins, 2016). With a case conceptualization perspective, these processes may be regarded as risk and/or maintenance factors for symptomatology or psychological disorders. This topic has three subtopics: (1) coping styles and defenses, (2) emotion processing difficulties, and (3) dysfunctional interpersonal cycles.

Mental skills and adaptive processes encompass the mental structures, abilities, and adaptive processes that are associated with mental health, well-being, and life satisfaction. Empirical findings suggest that these structures and processes are a core aspect of adaptive psychological functioning (Faustino et al., 2019a, Faustino et al., 2020a). Therefore, these mental abilities and processes may have a preponderant role in mental health and may be targeted for psychological intervention, such as the intensification of adaptive emotionality (Fosha, 2000). In this sense, the four subtopics are (1) psychological flexibility and emotion regulation, (2) metacognition and mentalization, and (3) acceptance, mindfulness, and compassion.

a. Diversity of the schematic functioning and states of mind

Maladaptive schemas and the pervasive emotional states that emerge from them are easily two of the most used psychological constructs, beyond different theoretical approaches, to describe latent variables underlying non-adaptive psychological functioning and emotional suffering (Faustino & Vasco, 2020a,b,c; Faustino & Vasco, 2021; Faustino et al., 2020a,b). Despite these recent empirical findings regarding maladaptive schemas, the *schema* concept can be traced back to Greek Stoic philosophers, especially Chrysippus (ca. 279–206 B.C.), who described the principles of logical thinking as "inference schemata" (Young et a., 2003). In the 20th century, the concept of schema can be traced to Barllet (1932, 1958) and Piaget (1926), who used this notion to describe latent mental structures that integrate and give meaning to the events (Beck, et al, 2004). The concept of the schema has a long history within cognitive development, cognitive psychology, and cognitive behavior therapy (Beck, et al, 2004; Rijo, 2009; Young et al., 2003). However, other authors and approaches have also used the concept of schema within their framework of reference (Faustino & Vasco, 2020a).

Further, there are many different, albeit related, definitions of the concept of schema, such as cognitive schemas (Beck et al., 2004; Piaget, 1926), emotional schemas (Greenberg and Pavio 1997; Leahy 2015), dysfunctional interpersonal schemas and cycles (Benjamin, 2010, Dimaggio et al. 2015; Safran and Murran 2000), attachment and motivational schemas (Cozolino, 2017) and early maladaptive schemas (Young et al., 2003). However, the concept of schema may have other definitions, such as personal constructs (Kelly, 1955), irrational beliefs (Ellis and Bernard 1985), self-wounds (Wolf 2005), and social scripts (Fiske and Taylor 2017).

One emergent research finding in previous investigations is the relationships between schemas and needs, which may imply that these two major psychological

variables are closely linked, probably, in a reciprocal manner. Vasco (2005) defined several ways in which maladaptive schemas may prevent the regulation of psychological needs: (a) by not developing an adaptive schema - consequently, lack of sensitivity and potentially regulatory agencies (b) schematic functions of hypo or hypervalence ; (c) difficulty in attributing meaning due to inaccessibility to all components of the schema ; (d) permanent conflict of activation of antagonistic schemas - conflict of contact / prevention; (e) and, finally, schematic interpersonal dissonance - inability to establish intimacy through interpersonal coordination (Vasco & Vaz-Velho, 2010).

Why is it that so many theories, despite their differences, tend to use a similar concept (internal stable structures) to describe how individuals attend to internal and external information, deal with internal suffering, make sense of their worlds and pursue different achievements and life goals? I will argue that different authors are looking for the *same* human universal phenomena from different perspectives, which are rooted in the theoretical model that underlies their understanding of mental phenomena and worldview. Another question can be raised. Why are different authors seeing similar aspects of this concept? Again, I will argue that *mental schemas* are universal latent mental structures that support human psychological functioning related to interpretations, meanings, representations, and inferences about oneself and others. I will suggest two candidates that can be used to understand why the concept of schemas is so recurring in the literature and which may also serve as common ground for a theoretical unification. The first is the information processing theory, which may be a resourceful candidate for a common ground for a theoretical integration of the concept of schema. The second is the neurobiology of schemas. Research supports the notion that schematic functioning may have clear neuronal pathways through different brain structures (Gilboa, 2017). In this sense, I outlined the concept of *mental schemas* as a unified concept for the

integration of early and cognitive schemas (Beck et al., 2004; Young et al., 2003), emotional schemas (Greenberg and Pavio 1997; Leahy 2015), interpersonal schemas (Benjamin, 2010, Dimaggio et al. 2015; Safran and Murran 2000), and attachment and motivational schemas (Cozolino, 2017) with a neurobiological model.

i. Information processing theory as a unified schema model

From the early fifties, a paradigm shift started to occur within mainstream psychology due to the analogy between brain and machine. Psychologists started to accept that the mind was a product of the brain, giving special attention to how the human mind processes information (Rijo, 2019; Schunk, 1996). Neisser (1967), in his book named *Cognitive Psychology,* defined human cognition as the study of the mental processes by which sensory stimuli are processed through a sequence of stages (Mulder, 1983). According to Neisser (1967), external and internal stimuli are transformed, reduced, elaborated, retrieved, and used through a sequence of stages or modes that leads to products of this processing (Driscoll, 1994; Mulder, 1983).

Cognitive Information Processing theory or simply *information processing paradigm* is a broad concept that is used to describe a number of different theoretical perspectives that emphasize the *sequence* and the *execution* of cognitive information or events (Ertmer & Newby, 1993; Schunk, 1996). It can be summarized with four typical stages in the information processing flow: (1) *attending* to environmental or internal events/stimuli, (2) *encoding* information to be learned and *associating* it to knowledge in memory, (3) *storing* new knowledge in memory, and (4) *retrieving/recalling* it as needed. In these paradigms, individuals are viewed as active seekers and processors of information (Ertmer & Newby, 1993).

Driscoll (1994) further elaborated this model by adding specific cognitive functions, such as *sensory memory*, *short-term memory,* and *long-term memory*, to the temporal sequence using the input and output computational metaphor. According to Driscoll (1994), sensory input reaches the first stage of processing, which is the *sensory* memory (such as visual, auditory). Then, through selective attention to stimuli, it flows to the second stage of processing, which is the *short-term memory* (working memory, rehearsal, chucking), which produces responses (thought, feelings, behaviors). Finally, if the processed information is adequately encoded and rehearsed, it flows to the third and final stage of *long-term memory, w*hich allows the recall or retrieval of the information. Driscoll (1994), with his model, combined not only three basic components of memory stages (*sensory memory*, *short-term memory,* and *long-term memory),* but also the process that allows the information to be transformed and transferred from one memory stage to the next (attention, rehearsal, encoding/chunking, and retrieval/recall). Driscoll (1994) details that *sensory memory* holds information associated with the senses (e.g., vision, visceral, hearing) for just a few seconds, long enough for further processing. *Short-term memory* acts as a temporary *working memory*, where limited information is encoded and prepared for long-term storage during a limited period. *Long-term memory* is the final stage of the information processing sequence, wherein the information is permanent and can be recalled unlimited times.

Moreover, in the *information processing paradigm,* information that is processed and transformed from one memory step to another in a bi-directional way (Ertmer & Newby, 1993; Schunk, (1996). For instance, a mental representation of a word or a sound is dependent on the physicality of the stimulus (data-driven, bottom-up processing) and the previous knowledge about words or vocabulary (conceptually driven, top-down processing). Thus, a mental representation about one aspect of a person's personality, such

as being a good friend, is driven by what the person sees the other doing (data-driven, bottom-up processing) and by one's prior knowledge (conceptually driven, top-down processing). According to Ertmer and Newby (1993), the relevance that is given to new information depends on prior knowledge and makes it easier for the individual to make connections between what he already knows and what he is about to process. *Selective attention is* crucial for the individual to engage different kinds of stimuli. However, the decision process underlying decision making towards stimuli is not always conscious. (Schneider and Shiffrin, (1977). I will elaborate on this idea further.

Selective attention is the cognitive process that allows individuals to select and process certain stimuli in detriment of others (Broabent, 1958 Schunk, 1996). Diverse factors influence selective attention, such as meaning (related to oneself), similarity (between competing tasks or other information), complexity or difficulty (prior knowledge), and attentional control (individual characteristics such as age, scholarship, neurocognitive abilities). Schneider and Shiffrin (1977) argue that *short-term memory* also plays a role in the underlying process of directing the attentional process due to pre-activated meaning-structures that help to capture incoming information from the sensory memory. This type of *operational memory* may also be described as working memory (Baddeley & Hitch, 1974). However, I will discriminate between these two types of memory.

Working memory is a cognitive process that has a limited capacity and is responsible for holding and transforming multimodal information (e.g., visual/spatial, verbal), and it plays a fundamental role in long-term memory, reasoning, and decision making (Diamond, 2013). S*hort-term memory* is related only to the short-term storage of information, whereas working memory allows for manipulation of stored information, which makes them distinct (Cowan, 2008). These two types of memory work by *chunking*

information according to similarities and size (short term memory has only capacity for 7 -+2 of items). Unrehearsed information tends to be lost in about 14 to 30 seconds (Diamond, 2013). As stated, two processes are working on this stage of information processing to transform and maintain information: *rehearsal* and *encoding.*

      Rehearsal refers to the repetition of the items in memory to maintain them in *short-term memory* for some time, so that they are deeply processed and move to further stages. However, rehearsal of the complex information is not enough for it to reach long-term memory, and typically the cognitive system engages in elaborative rehearsal or encoding (Ertmer & Newby, 1993; Schunk, 1996). *Encoding* is the cognitive process responsible for the association, connection, or relation of incoming information with previous mental representations, such as concepts, meanings, beliefs, notions, or conceptualizations (Ertmer & Newby, 1993; Schunk, 1996). Some organizing *schemes* can be listed as categories, hierarchies, concepts, imagery. *Elaborative encoding* tends to facilitate memorization due to simple repetition of items, which facilitates long-term storage and consequently the retrieval of information.

      Retrieval is the process that brings to mind previously learned information from long-term memory, allowing for (a) understanding of new incoming information and (b) making a response (Ertmer & Newby, 1993). In this process, there are two ways in which individuals retrieve memory information: through *recall* (free or cued) or *recognition*. Individuals tend to *free recall* when information just reaches conciousness with no cues or hints that help them to remember. In *cued recall*, individuals remember information due to a hint or a given cue (Schunk, 1996). In *recognition*, individuals access learned information through regenerated stimuli (e.g., similar situations or persons), which work as retrieval cues (Schunk, 1996).

These complex operations that were described are the core processes that allow humans to process information conscious or/and unconsciously, which may support the transtheoretical concept of *schema*. Matthews and Harley (1996) state that some of these operations may operate beyond consciousness, due to limited cognitive resources. Therefore, information processing is dependent on two types of processes, one *automatic/unconscious* and the other *strategic/conscious*. These two types are dependent on the different resources of the organism and the amount, salience, and meaning of information that is about to be processed (Rijo, 2009).

Moreover, Garforth and colleges (2006) elaborated on the Supervisory Attentional System (SAS) model by Shallice (1988) and stated the following: "*Information from sensory pathways is mapped by a trigger database into a repertoire of behaviours (schemata); competing (contradictory) behaviours are subject to selection by contention scheduling; the output of psychological processing systems is mapped onto effector systems. Persistence is reinforced by effector feedback to the trigger database. The supervisory attentional system (SAS) modulates the triggering signals (solid arrow indicates potentiation, broken arrow indicated attenuation). The SAS monitors the selected behaviours, producing an 'interrupt' signal if there is a separation between intended and expressed action and subsequently applying a modulatory signal to contending behaviours*".

The information processing paradigm provides a science-based model that helps to explain how individuals process mental information and how they interpret situations and direct behavior. Applying these processes and operations to the real world, one could argue that it is in the *first stage* of processing that individuals perceive cognitive, affective, and social stimuli. In the *second stage,* individuals *interpret* and *assign meaning* to the events. In the *third stage*, individuals may memorize or store the meaning and the

information that was processed. This may also be described through different modalities of the experiential cycle (cognition, emotion, behavior, motivation, and physiology). Thus, the information that will be further processed will be that which is congruent with information in memory due to a cognitive bias. Thus, the understanding of the sequential nature and interrelationships between cognition and schematic functioning is one of the major aims of the present doctoral thesis. The model described by Garforth and colleges (2006), of the SAS (Shallice, 1988), illustrates an adequate representation of the described operations – see figure 1.
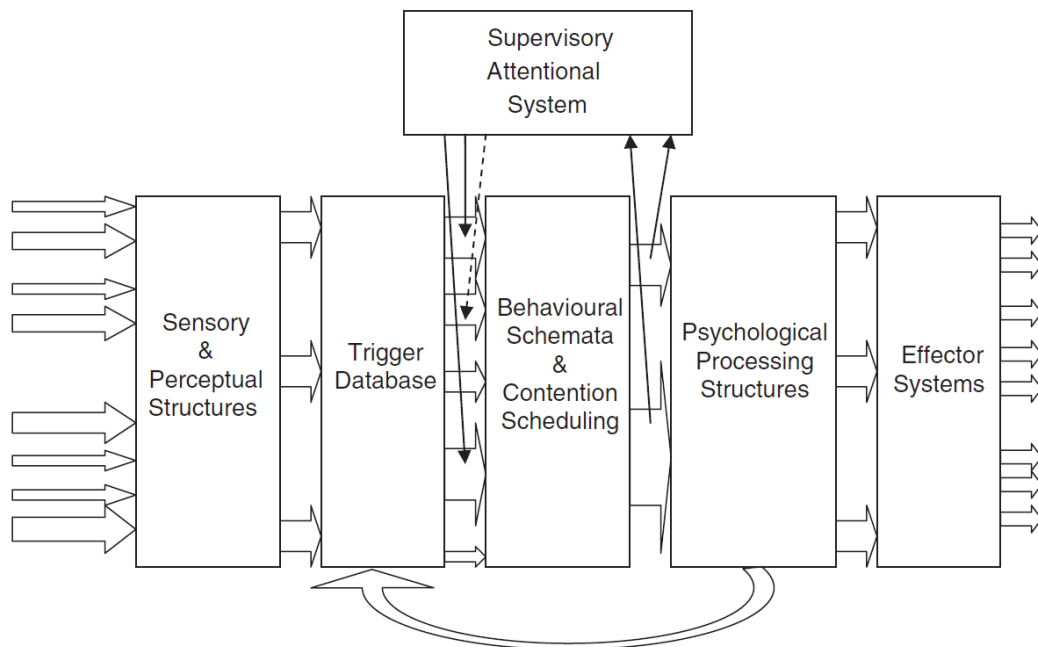
Figure 2. Norman and Shallice architecture for executive control of routine and non-routine behaviour (Adapted from Garforth et all., 2006).

The requirements of unsafe contexts of attachment and learning, leading to the development of schemas or wounds of the Self also prevent the regulation of needs in different ways: (a) by not developing an adaptive value schema - consequently, lack of sensitivity and potentially regulatory agencies , as can be seen, for example, in the absence of actions to establish a location; (b) schematic functions of hypo or hypervalence - when excessively high or low levels of stimulation are applied in order for the scheme to be

activated, as can be seen in situations of continued abuse that only activate a protection scheme late, or in the case of hypervalence, early activation of an abandonment scheme in the face of a minimal differentiation response from the others; (c) difficulty to attribute meaning due to inaccessibility to all components of the scheme - vague emotional feeling of discomfort without understanding what is happening; (d) permanent conflict of activation of antagonistic schemes - conflict of contact / prevention; (e) and, finally, schematic interpersonal dissonance - inability to establish intimacy through interpersonal coordination, as in the case of non-reciprocal disclosure of intimacy (Fonseca & Vasco, 2014; Vasco & Vaz-Velho, 2010).

Having arrived at this point, it is safe to say with this paradigm will be the core structure of this work. This paradigm will be used to understand and describe the different concepts of schemas from different theoretical orientations. My claim is that the *information processing paradigm* could be used to integrate different concepts of the schema (e.g., cognitive, emotional), because all definitions are rooted in the idea of a structure in memory shaped by a combination of innate structures and experience-based knowledge that helps humans to give sense and navigate through their lives. Moreover, the described schematic operations are encoded in different neuronal pathways and brain structures that are the core neurobiological substrate of human experience and behavior (Gilboa, 2017; Cozolino, 2010, 2017). These neurobiological substrates of schemas will be briefly described in the next chapter. Now, different schema concepts will be described.

ii.   Early maladaptive and cognitive schemas

Cognitive Behavior Therapy can be viewed as the most straightforward application of the information processing paradigm, utilizing the empirical findings from

cognitive psychology research to clinical practice. Beyond Piaget's theory of cognitive development in the cognitive approach, there are two main definitions of schemas that have clear clinical relevance: cognitive schemas from Beck´s model and early maladaptive schemas, from Young´s model.

According to Ingram and Kendall, (1986), this information processing paradigm assumes that mental operations and contents (cognitive, affective, or interpersonal), which depend on the acquisition, transformation, and storage of information about self, others, and the world, can be applied to clinical settings. The authors describe that these processes or modes of processing information may underlie cognition, emotions, and behaviors in healthy and/or psychopathological conditions. Ingram and Kendall, (1986) developed an integrated taxonomy with four components: (1) structures or schemas, (2) cognitive contents, (3) cognitive operations, and (4) cognitive products. This model was also important for the cognitive conceptualization of schemas in the Beckian theory. According to Beck's cognitive model, schemas are the underlying highly personalized structures with idiosyncratic contents that attach meaning to the events and modulate emotion, motivation, and behavior (Beck, et al., 2004). Schemas are the fundamental units of mental information processing and are embedded within the self, being either adaptive or maladaptive (Beck, et al., 2004). The authors described that individuals with personality disorders tend to have internal dysfunctional and rigid beliefs about the self (e., unlovable, not worthy, inadequate, incompetent) and others (e.g., threatening, controlling, abusing, hypercritical, ideal), which underlie emotional suffering. Schemas have structural features such as breadth (narrow, discrete, or broad), flexibility or rigidity (modification), density (relevance in the cognitive organization), and valence (latent or hypervalent). Despite this conceptualization of schemas, some authors felt the need for a

deeper and developmental account of the origin for these pervasive underlying structures that were hypothesized as the core of psychological disorders (Young et al., 2003).

Acknowledging the limitations of cognitive therapy in treating personality disorders and characterological patients, Young and collaborators developed an approach that expands the cognitive therapy model of schemas. Schema Therapy is an integrative approach that blends coherently several components from cognitive-behavioral, emotional, relational, and interpersonal traditions in a rich unified model focused on the pervasive schemas developed through lifetime, since childhood (Young, Klosko, & Weishaar, 2003). Young, Klosko, and Weishaar (2003) focused on the developmental origins of schemas and expanded the notion of Beck´s cognitive schemas. Therefore, early maladaptive schemas are dysfunctional mental structures with four components, namely cognitions (e.g., verbalizations and images), memories, emotions, and bodily sensations, developed in infancy or adolescence and developed throughout life (Young, Klosko & Weishaar 2003). These schemas are related to oneself and others and are broad, rigid, inflexible, and impermeable to experience. When activated, the individual feels high levels of emotional pain, psychological distress, and interpersonal disturbances because schemas encapsulate the dysfunctional emotional memory that individuals had experienced in the past regarding the frustration of core emotional needs (Young, Klosko & Weishaar 2003). Thus, early maladaptive schemas were the first templates that represented the early environment and the world around them. And as mentioned in the second chapter, early complex trauma, affective temperamental traits, parenting styles, dysfunctional psychological process, and sensitive periods interact to develop and maintain a full-blown schema. Early schemas are the building blocks of the core self and tend to have an identity value, which in part, helps to explain why they are so rigid,

inflexible, and resistant to change. Therefore, early maladaptive schemas are regarded as personality *traits* (Young, Klosko, & Weishaar, 2003).

One major aspect that is closely related to schema perpetuation is the schema coping styles. To deal with the emotional pain of an activated schema, individuals use different coping styles, namely avoidance, overcompensation, and surrender. For instance, a man that has a defectiveness schema may go to a job interview, but when he reaches the door his anxiety levels raise to a point that he cannot bear and he leaves - *avoidance*. A woman with an abandonment/instability schema who is a victim in a toxic relationship may *surrender* and allow maltreatment to maintain that relationship. An individual with a social isolation schema who starts to feel alienated and disconnected from his friends at a party may *overcompensates* by "acting to become the center of the party".

Young, Klosko, and Weishaar, (2003) defined five schema domains (e.g., disconnection and rejection domain, impaired limits) that encompass eighteen schemas (e.g., abandonment/instability, mistrust/abuse, subjugation, grandiosity high standards). Each schema domain represents a cluster of schemas that were developed due to the frustration of different core emotional needs, which is aligned with previous research regarding the regulation of psychological needs. Thus, previous research has provided a substantive amount of evidence that supports previous theoretical assumptions. Thus, previous research, on one hand, has consistently described negative correlations between early maladaptive schemas and the regulation of psychological needs (Faustino & Vasco, 2020a, b, c; Faustino et al., 2019; Fonseca, 2012) and psychological well-being (Faustino & Vasco, 2020a, Fonseca, 2012). On the other hand, several studies documented positive correlations between early maladaptive schemas and cognitive fusion (Faustino & Vasco, 2020a,b,), interpersonal dysfunctional cycles (Faustino & Vasco, 2020a), alexithymia

(Fonseca, 2012), emotion processing difficulties (Faustino & Vasco, 2020c; Faustino et al., 2019), psychological distress and symptomatology (Faustino & Vasco, 2020a, b, c Fonseca, 2012).

Nevertheless, the described research went further on the exploration of the relationship between early maladaptive schemas and other psychological constructs. Faustino and Vasco (2020a), through a multiple hierarchical regression model, showed that the schema domain of disconnection and rejection was the most significant predictor of the regulation of psychological needs. In another study, Faustino & Vasco (2020b) showed that all schema domains were negatively correlated with the dialectical polarities of the regulation of psychological needs. In the same study, the authors found that cognitive fusion was a significant mediator of the relationship between all schema domains and the regulation of psychological needs.

Further, Faustino and Vasco (2020c) showed, with a clinical sample, that the three schema domains of disconnection and rejection, underdeveloped autonomy, and impaired limits were significant mediators of the relationship between emotion processing difficulties and the regulation of psychological needs. Thus, early maladaptive schemas tend to be significant mediators between several psychological variables and symptomatology (Balsamo et al., 2015; Roelofs et al., 2011; Roelofs et al., 2013; Schatzman, 2009). Moreover, there is now a consistent body of research that supports the previous assumption that early maladaptive schemas may be a transdiagnostic latent construct that underlies several psychological dysfunctional constructs, such as depression (Renner et al. 2012), anxiety (Hawke & Provencher 2011), somatization disorders (Davoodi et al. 2018), aggressive mood styles (Dubois et al. 2009), meaning-making and grief (Thimm and Holland 2017), interpersonal problems (Janovsky et al.,

2019; Thimm, 2013), emotional dysregulation (Dadomo et al., 2018), personality disorders (Lobbestael et al., 2008), and psychiatric symptoms (Welburn et al., 2002).

As said before, the concept of early maladaptive schema was elaborated by Young and colleagues (2003) in an integrative fashion to capture the diversity of notions of schemas. This is quite challenging and as was shown previously research has supported this concept. However, the main problem with such a generic definition such as "*a broad, pervasive theme or pattern, comprised of memories, emotions, cognitions, and bodily sensations, regarding oneself and one's relationships with others, developed during childhood or adolescence, elaborated throughout one's lifetime and dysfunctional to a significant degree*" (Young, et al., 2003, pp.7) is that it blends different aspects of the schematic functioning that could be differentiated targets for elucidated psychotherapeutic intervention. Thus, according to Dimaggio et al., (2015), the Young Schema Questionnaire (which is the most recognizable instrument to assess schemas), blends schematic elements as self-images or beliefs, needs, coping behaviors, and interpersonal relationships, which may be problematic due to the lack of differentiation between other types of schemas. Thus, as described in the beginning of this chapter, several authors have different concepts of *schemas* (Lehay, 2012; Greenberg, 2015; Dimaggio et al., 2015), which may be very useful in an integrative case conceptualization. Therefore, emotional, and interpersonal schemas will be described shortly.

iii.   Emotional schemas and emotional experiences

The concept of *schema* may have different meanings and may represent different views of different authors rooted in their theoretical orientations. Several approaches that tend to emphasize specific psychological constructs tend to have some form of the notion of schemas. As stated before, Schema Therapy (ST; Young, et a., 2003) has the concept

of *early maladaptive schema*, Emotion-Focused Therapy (EFT; Greenberg, 2015) has the concept of *emotion scheme*, Emotional Schema Therapy (EST; Leahy, 2002) has the concept of *emotional schema* and Metacognitive Interpersonal Therapy (MIT; Dimaggio et al., 2015) and Alliance Focused Therapy (AFT, Saffran & Murran, 2000) have the concept of *interpersonal schema*. Therefore, I will focus now on emotional and interpersonal schemas. Emotion schemes (Greenberg, 2015) and emotional schemas (Lehay, 2002), despite phonological and orthographic similarities, are quite different. According to Pascual-Leone and Greenberg (1997), *emotion schemes* are affective-cognitive structures that work as internal templates which attach meaning to the events and give rise to an integrated conscious experience. Emotion schemas are structures that articulate cognitive, affective, episodic memory, physiological, and motor-expressive components that could potentially be reorganized during the lifespan as a result of experience (Pascual-Leone & Greenberg, 1997; Greenberg, 2015). In EFT emotions are a core element of case conceptualization and intervention. Moreover, emotions need to be expressed, validated, understood, clarified, and recognized for dysfunctional emotion schemes to be transformed. Thus, emotions also inform the degree of the regulation of psychological needs, as they have functions such as guidance, communication, prevention, and signaling of the emotional experience (Vasco, 2001, 2005; Vasco et al., 2018).

Despite the centrality of the emotional experience in EFT, it is noteworthy that their definition of *emotion schemes* is quite similar to the notion of ST of an *early maladaptive schema*. Both emphasize the structural notion of schemas and several mental components (e.g., memories, cognitions, physical reactions). However, in the EFT notion, *emotion schemes* may reorganize throughout the life span, and in the ST notion, *early maladaptive schemas* are developed during infancy and adolescence and may have been

interpersonal. Therefore, the EFT notion does not increase a substantial value on the conceptualization of an emotional schema differentiated from *early maladaptive schemas,* because they are referring to the same components with slightly different aspects. However, according to the EST (Lehay, 2020) definition things may be different.

According to Lehay (2002), *emotional schemas* are the specific core beliefs and dysfunctional coping strategies that individuals tend to use to cope with distressful emotional experiences. This concept is rooted in the CBT view of schemas as core beliefs (Beck et al., 1979; Beck et al, 2004; Beck, 2011). However, this conceptualization expands the traditional CBT view, normally focused on dysfunctional beliefs, attitudes, and behaviors about the self, others, and the world (Lehay, 2015), because the author introduces the concept of emotions and emotional experience, which was in the background (Faustino, Vasco, Nunes & Marques, 2020).

Moreover, Lehay (2014) elaborated on fourteen dimensions of emotional schemas, divided into beliefs about emotions (e.g., comprehensibility, duration, acceptance,) and coping strategies (e.g., suppression, control, rationality) and research has partially supported his assumptions (Nunes et al., 2019). Emotional schemas were associated with depression, anxiety, trauma, alexithymia, and difficulties in the socialization of emotions (Lehay, 2011; Lehay et al., 2018; Edwards et al., 2016; Edwards et al., 2018; Palmeira et al., 2011). Thus, Silberstein and colleagues (2012) described that individuals with higher values on trait mindfulness and psychological flexibility showed less emotional schemas (dysfunctional beliefs and coping strategies). Also, research may support the transdiagnostic value of emotional schemas, where several beliefs of non-acceptance of emotions and coping strategies of control of emotions may be the same across the spectrum of anxiety disorders (Lehay, 2007). Finally, in a recent study, Faustino and colleagues (2020) described several mediation models. The relationship

between emotional schemas and symptomatology was mediated by self-compassion and the relationship between emotional schemas and the regulation of psychological needs was mediated by self-compassion and mindfulness.

In this sense, emotional schemas seem to be a relevant variable to be considered in the present work. Despite this notion of emotional schemas, which may be regarded through a socio-cognitive perspective (Lehay, 2015), there seems to be lacking a clear conceptualization of the interpersonal structures that guide and rule social behavior. Thus, socio-cognitive perspectives tend to emphasize the cognitive components of social behavior (Tylor and Fiske, 1991) and rule out the internalized structures of interpersonal schemas, which will be described next.

iv.   Interpersonal and Relational Schemas

Human emotions are experienced with different people in different contexts. Attachment and affective regulation are some of the most fundamental aspects of human life that start to be shaped through repetitive relational experiences since childhood (Bolwby, 1979; Siegel, 2012). Individuals learn to regulate their emotions and to predict the availability of the caregiver to satisfy their needs, and this is considered the beginning of the development of the interpersonal schemas (Dimaggio et al., 2015; Safran, & Murran, 2000). The concept of interpersonal schemas may be found in Attachment-Based Therapy (ABT, Dozier, 2003), Alliance-Focused Therapy (AFT; Safran & Murran, 2000; Saffran et a., 2011), Metacognitive Interpersonal Therapy, (MIT; Dimaggio et al., 2015), Interpersonal Reconstructive Therapy (IRT; Benjamin, 2006, 2018), Schema Therapy with Couples, (ST-C; Simeone-DiFrancesco et al., 2015) and in Brief-Dynamic Relational Therapy (BDRT; Körner et al., 2004). As stated before, different authors

develop different conceptualizations based on the same phenomena. However, there is substantial overlap between these definitions.

Interpersonal or relational schemas are stable belief structures, developed through the repeated interaction between temperament and relational experiences, which individuals tend to use to guide their behaviour in social situations and to develop predictions about others' responses to their behaviour (Benjamin, 2018; Dimaggio et al., 2015; Simeone-DiFrancesco et al., 2015). These internal structures contain cognitive-affective-somatic elements that help individuals understand and predict others and make assumptions related to their responses (Safran & Murran, 2000). Interpersonal schemas are intrapsychic mental structures that contain generalized representations of *self-other* interactions developed during the activation of interpersonal motivational systems (e.g., secure attachment, cooperation, and belonging) which are a direct consequence of evolutionarily selected neurobiological systems for survival and adaptation to social interactions (Bowlby, 1979; Dimaggio et a., 2015; Panksepp, 1998; Siegel, 2012). Thus, the similarities between interpersonal motivations and other constructs described previously are noteworthy. Interpersonal motivational systems, emotional core needs, and psychological needs are different concepts to describe the same human phenomenon (see chapter two for details).

According to Dimaggio et al., (2015), the structure of an interpersonal schema has five components: (1) interpersonal motivation/wish, (2) if… then... procedures, (3) other response, (4) self-reaction to other response and (5) self-image. These components are somewhat similar to Beck's approach to schemas and core beliefs (Beck, 2011), but they are framed considering a social context and interactions. Further, this internal schema structure may be adaptive or maladaptive as a function of the schematic content. For example, an individual driven by cooperation (interpersonal motivation) may think,

"Maybe If I ask if I can help…" (if… then... procedure), expects rejection (other response), may start to have feelings of being excluded or of non-lovability (self-reaction to other response) and may develop a self-representation of a non-lovable person (self-image). Another example may be that of an individual driven by social status (interpersonal motivation), who may think, "If I don´t get that promotion, I won´t be nobody…" (if… then... procedure), expects devaluation (other response), may start to have feelings of incompetence, unworthiness or defectiveness (self-reaction to other response) and may develop a self-representation of a flawed and unworthy person (self-image).

Previous research on interpersonal or relational schemas has suffered by fragmentation of assessment instruments, despite considerable overlap. Different instruments assess different aspects of the interpersonal schemas or even social domains. To assess interpersonal schemas, some researchers use the Young Schema Questionnaire (YSQ; Young, 2005), which is used to evaluate early maladaptive schemas, the Interpersonal Schema Questionnaire (ISQ; Hill & Saffran, 1994), Relationship Patterns Questionnaire (RPQ, Kurth & Pokorny, 1999), Inventory of Interpersonal Problems (IIP, Horowitz et al., 1988) or some form of attachment assessment measure (Ravitz, et al., 2010). However, one of the most used is the YSQ (Young, 2005) and this may be due to the interpersonal dimension that the definition of *early maladaptive* schemas encompasses. Thus, according to Simeone-DiFrancesco and colleagues (2015), ten of the eighteen early schemas are interpersonal by definition and that is why they tend to be found in couple's therapy.

Moreover, maladaptive interpersonal schemas are associated with borderline personality disorder (Cohen et al., 2016), psychological symptoms and parenting styles (Soygüt & Cakir, 2009), traumatic childhood and interpersonal styles (Kaya Tezel et al.,

2015), interpersonal trauma (Karatzias et al., 2016) and interpersonal problems (Janovsky et al., 2019; Thim, 2013). Thus, Janovsky and colleagues (2019) describes a meta-analytic study regarding associations between early maladaptive schemas and interpersonal problems. The authors found a moderate positive association between interpersonal problems and several schemas, with small to moderate effect sizes, despite the overlap. This is surprising due to the similarities of the constructs. So, if early maladaptive schemas are interpersonal by nature, why is it that a metanalytic study found only small effect sizes between schemas and interpersonal problems? Maybe this means that maladaptive schemas and interpersonal problems are different constructs and maybe there is here some space for improvement in differentiating the interpersonal aspect of the early maladaptive schemas. Thus, this is one of the major aspects of this research, which is to clarify different early maladaptive schemas, such as cognitive, emotional, and interpersonal, through empirical data. In conclusion, individuals develop stable belief structures (e.g., schemas) about the self and others due to continued relational experiences since childhood. These structures are a product of the interaction between affective temperament and early experiences regarding the frustration or satisfaction of evolutionarily selected neurobiological systems of interpersonal motivations, emotional and psychological needs. Schemas are *trait*-like structures that help individuals make sense of their internal and external world and have predictive, attributional, and inferential functions regarding oneself and the relationship with others. Schemas are the fundamental building blocks of personality and are viewed as the core self, and intrinsically associated with identity values.

From an integrative disorder theory and transtheoretical case conceptualization perspective, temperamental traits are viewed as *level one traits* (genetically saturated) and schemas are regarded as *level two traits* (experience-saturated). Furthermore, several

maladaptive schemas may be developed through different dysfunctional experiences, which means that an individual may develop several schemas concomitantly with the same characteristics (breadth - narrow, discrete, or broad; rigidity – modification; density - relevance in the cognitive organization; valence - latent or hypervalent), or severity. In this sense, an individual may have schemas of abandonment, non-acceptance, or social isolation that activate together and cluster together in the flow of consciousness. In this sense, individuals may have some episodic autobiographic memories, attributions, beliefs, and feelings from different schemas activated at the same time. This is called a recurring state of mind (Horowitz, 1979) and/or a schema mode (Young et al., 2003). Typically, these individuals suffer from characterological or lifelong psychological disorders, such as recurring depression of personality disorders (Young et al., 2003). States of mind and schema modes are higher-order abstractions with clinical utility in integrative and transtheoretical case conceptualization.

v. States of mind, schema modes, and the self

Emotionally laden subjective states are an essential part of human internal experiences and constitute a significant domain of personality. This research is beyond the dichotomy of *trait* vs *state* because it is assumed that both psychological constructs belong to the human sphere. Humans have personality *traits* and recuring emotional *states* that encompass several elements of the mind that tend to cluster together (Horowitz, 1989). Thus, this integrative case conceptualization proposal is aligned with a clinical decision making focused on moment-to-moment emotional states and phase-by-phase personality traits (e.g., schemas, affective temperamental styles).This will be elaborated and described further in the fifth chapter. Similar to schemas, different theoretical approaches look at these elements from their worldview and tend to give different

versions of the notion of emotional or cognitive *states* (Beck, et al., 2004; Dimaggio et al., 2015; Greenberg, 2015; Horowitz, 1979; Ryle, 2005; Siegel, 2012; Young et al., 2003). However, there seem to be two main ways of distinguishing states that have similarities and differences, which is the notion of *states of mind* (Horowitz, 1989) and *schema modes* (Young et al., 2003). Both concepts are intrinsically related to the notion of *self* and may represent different aspects of it, with clinical utility.

Rooted in the personal construct theory from George Kelly (1955), Horowitz (1979) defined recurring *states of mind* as patterns of subjective experience that tend to cluster or activate together several mental elements such as emotions, feelings, cognitions, needs, desires, and physiological sensations that motivate behavior. According to Horowitz (1979), these states are experience-dependent and are elaborated through one's life. Some states of mind are charged with emotional suffering, some may serve coping functions, and some may have adaptive functions (Dimaggio et al., 2015; Faustino et al., 2021). For example, someone may be in a state of tranquility while watching a movie, with feelings of security, calm, and relaxation, but if he/she receives a call from their boss, the emotional state may change and he/she may suddenly feel threatened and/or worry, as several recurring elements, such as memories, cognitions, and physical sensations have been activated together in the flow of consciousness (state of relational danger/vulnerability). Another example can be that of a person who enters a state of loneliness, emotional frustration and neglect and who can engage in various attempts to avoid these types of feelings with alcohol, sex, gambling, or extreme sports. Thus, states of mind have been theoretically associated with the concept of the *self* (Dimaggio et al. 2015)*,* due to the different functionality of those states. This will be described briefly.

Similar to the concept of states of mind is the notion of schema mode, which is aligned with the CBT approach (Beck et al., 2004). Young and colleagues (2003) define schema modes as the moment-to-moment emotional states that group one or more early maladaptive schemas with a crystallized coping strategy used to cope with those maladaptive schemas. The similarities with the concept of states of mind are notorious. As defined previously, *states of mind* are patterns of subjective experience which tend to cluster or activate together several mental elements such as emotions, feelings, cognitions, needs, and desires (Horowitz, 1979). Thus, both constructs share the same mental elements (for example, emotions, cognition), which are contextually activated by internal or external stimuli. However, a distinction can be made within an integrative perspective. Faustino and colleagues (2020) stated that due to the theoretical root of states of mind (personal construct theory) they can be more saturated in the internal and experiential sphere, while the schema modes can be more saturated with operant and external behavior (cognitive behavior theory). However, this is beyond the scope of this research, and will be explored in the future.

Both constructs have been related to the notion of self (Dimaggio et al., 2015; Faustino, et al., 2020; Young et al., 2003). Dimaggio et al., (2015) defined three types of states of mind that represent different aspects of the self: suffered and fearful states, coping states, and egosyntonic states. The suffered and fearful states are the dysfunctional states of mind that individuals try to avoid, escape, suppress or transform because they encompass the emotional pain and suffering that is coded on the autobiographic episodic memories (e.g., abandonment, relational danger, fear of judgment). The coping states are the states of mind that individuals use to cope with the emotional pain that stems from the fearful states (e.g., self-protective anger, subjugation, emotional avoidance). The egosintonic states are the ones which adequately may have an adaptive value, but they

tend to escalate to dysfunctional states (e.g., status-seeking, grandiosity). Moreover, Faustino and colleagues (2020), in a recent work, reframed these three domains and added another one: suffered and fearful states (vulnerable self), coping states (coping self), and egosintonic states (valued self), and adaptive states (healthy self). The adaptive states encompass states of mind that are healthy and should be developed or promoted (e.g., interpersonal relatedness, self-compassion, and trust). Young and colleagues (2003) initially divided schema modes into child models (e.g., vulnerable, impulsive, happy), maladaptive coping modes (e.g., avoidant, surrender), dysfunctional parent modes (e.g., demanding), and healthy mode. Several more modes were added and received empirical support (Lobbestael et al., 2008; Lobbestael et al., 2010) and were associated with several personality disorders, such as narcissistic, paranoid, dependent, and obsessive-compulsive personality disorders (Arntz et al., 2005; Bamelis et al., 2011).

It is important to clarify the difference between schemas and states. The concept of schemas is used to describe a *trait-like* mental structure that encompasses memories, emotions, cognitions, and physical sensations that belong to the core self (Faustino et al., 2020). This means that schemas tend to be activated regardless of the context because they tend to be generalized and less saturated in the context (Young et al., 2003). While states of mind and modes are the moment-to-moment *state's* structures contextually dependent or saturated (Faustino et al., 2020). They tend to be more volatile than schemas, but they can be painful as well (Dimaggio et al., 2015; Young et al., 2003). However, maladaptive schemas and states of mind are related because they both encompass, to some extent, affective and cognitive components embedded in different cognitive, affective, and interpersonal domains. Thus, previous research showed that schemas and states are associated in clinical samples (Faustino & Vasco, 2020c) and non-clinical samples (Faustino et al., 2019; Faustino et al., 2020a,b; Faustino & Vasco, 2021).

Why are states of mind and schema modes so important in the present research? This is highly relevant to the case conceptualization because it can inform decisions concerning different tasks. For example, for an emotional state with feelings of abandonment and non-lovability, a task based on experiential focusing may be adequate and for a maladaptive coping mode focused on the pursuit of pleasure-seeking, a behavioral task may be more appropriate. In this present work, however, only states will be explored with other variables, but in the future, the relationship between states of mind and schema modes will be addressed (see limitations section).

Concluding thoughts and articulation

Maladaptive schemas may have different configurations and components, but they all share commonalities (e.g., cognitions, needs, emotions), which are thematically and structurally related. For instance, a *cognitive schema* may have memories, attributions, and beliefs which are emotionally laded (e.g., defectiveness schema: "*I am unworthy, because of the bullying that I suffered*"). An emotional schema may also have memories and images which have some meaning attached (e.g., non-acceptance of emotions schema: "*I can´t stand what I feel, and this makes me a weak person*"). An interpersonal schema may have some form of emotionality attached (e.g., social relatedness schema: "*They are always rejecting me*"). Therefore, it is possible to argue that all schemas may encompass to some degree any form of defensive maneuvers or dysfunctional consequences, such as emotional difficulties or coping styles. This will be further elaborated.

As stated before, individuals tend to develop experience-based cognitive-affective-relational structures that help them attach meaning to the events and navigate different contexts and social events. When several dysfunctional variables cluster

together recurrently (e.g., trauma, dissociation, affective temperament, parenting styles), individuals tend to develop maladaptive schemas that disrupt the regulation of psychological needs. These schemas may assume *trait-like* structures or *states-like* modes that express different facts of the self. Maladaptive schemas and suffered states of mind encompass the emotional pain and suffering that individuals have experienced and carry with them. Therefore, due to that emotional pain, individuals engage in different forms of *defensive maneuvers*, to escape, avoid, suppress, or transform these painful states. Also, some dysfunctional consequences may stem from different schemas, such as coping responses, emotional processing difficulties, and interpersonal dysfunctional cycles. These constructs will be described below.

b. Defensive maneuvers and dysfunctional consequences: Essentials of schema perpetuation process

Maladaptive schemas are the core dysfunctional mental structures that encompass several elements of the experiential intrapsychic cycle such as memories, emotions, cognitions, needs, and bodily sensations, emotionally and thematically related (e.g., abandonment, emotional privation, social isolation, unworthiness). Maladaptive schemas may be assuming cognitive, emotional, or interpersonal configurations. Along with temperamental traits, they are the most fundamental aspects of human personality and have an intrinsic identity value. When several schemas activate and cluster together on the flow of consciousness, they give rise to different states of mind or schema modes.

The human mind is very complex, and it does not respond passively to different stimuli from painful autobiographic experiences, unmet core emotional needs, trauma memories, or irrational beliefs. Due to the agency feature of the human mind, it can act and react with and within its themes in several configurations. In this sense, individuals

engage in different schema related *defensive maneuvers and dysfunctional consequences* to avoid, suppress, overcompensate, or transform the emotional pain and suffering that stems from the activated maladaptive schemas or states. These maneuvers are attempts to somehow heal those schemas; however, they end up perpetuating those schemas because they do not allow individuals to engage in corrective cognitive, affective, and relational experiences which are a necessity for schema restructuring and/or rescripting. From a case conceptualization perspective, these schematic consequences may be regarded as maintenance factors and are core targets for psychotherapeutic intervention, therefore, the next section will describe the following elements: (1) coping styles and defenses, (2) emotional processing difficulties, and (3) interpersonal dysfunctional cycles. These elements are theoretically related to specific maladaptive schemas.

i. Coping Styles and Defenses

It is widely accepted that individuals are not passive receivers of information (Beck et al., 2004; Horowitz, 1979). One of the most recognizable *traits* of the human species is the ability to endure extremely hard conditions, persevere in the face of trauma and loss, overcome lifelong difficulties, and prosper even against all the odds (Buss, 2011; Tyron, 2014). In part, this is possible due to higher levels of resiliency, peer support, and environmental contextualized factors (Buss, 1995, 2011, Cozolino, 2017). Still, another core variable in this equation is the ability to deal with inner suffering and manage emotional distress. The most recognizable psychological constructs related to this notion are the concepts of coping mechanisms and defensive mechanisms (Freud, 1928). These two notions stem from different theoretical orientations. However, from an integrative perspective, both mechanisms represent different sides of the same construct and this can be objectively identified through different criteria (Cramer, 1998).

Coping strategies and defense mechanisms have similarities and differences that are recognizable, and they can be used to conceptualize how individuals cope with their emotional suffering and life adversities. Coping strategies and defense mechanisms are processes that emerge during psychological uncertainty or disequilibrium. In this sense, both processes serve the purpose of psychological restoration. Coping strategies have the function of decreasing unpleasant affect, returning the individual to baseline functioning, and facilitating problem-solving (Cramer, 1998). Defense mechanisms have the purpose of eliminating disruptive effect and replace adequate psychological functioning. That is the overlapping functionality, but clear distinctions can be made to emphasize the difference between these constructs (Miceli & Castelfranchi, 2001).

Coping strategies tend to be described as a conscious process with some form of intentionality (e.g., problem-solving behavioral skills), while defense mechanisms are described an unconscious and unintentional process (e.g., denial, sublimation). When faced with adversity, individuals engage in conscious, effortful, and intentional cognitive, affective, and behavioral actions to cope with the situation. One example may be an individual with an emotional deprivation schema at the end of a day of work, who starts to actively drink to avoid feelings of loneliness, affective frustration, or defectiveness. This is an example of experiential avoidance (Hayes et al., 2011), based on a conscious, coping strategy. However, individuals can also deal with emotional distress with automatic processes or defense mechanisms, through which they block distressing emotionality to reach a level of awareness that would be unbearable. An example may be the same individual from the previous example, who has an emotional deprivation schema, and who may also have anger management issues but fails to acknowledge these difficulties and then projects them onto his co-workers (projection). Moreover, Cramer (1998) stated that coping strategies and defense mechanisms may also be differentiated

by three criteria: hierarchical vs non-hierarchical, situational vs dispositional, or pathological vs non-pathological. However, there is little empirical support to sustain these theoretical assumptions. Nonetheless, these theoretical distinctions may be further explored in subsequent research projects.

From an integrative perspective, coping strategies and defense mechanisms are all the internal and external actions that individuals do to *avoid*, *suppress*, *overcompensate* or *transform* emotional suffering that stems from the activation of maladaptive schemas or states of mind (Dimaggio et al., 2015; Young et al., 2003). These processes may be divided through criteria (e.g., intentional vs unintentional, conscious vs unconscious) which may inform different therapeutic tasks. They act as partially adaptive mechanisms but fail to adequately heal or restructure maladaptive schemas and states of mind because they end up reinforcing those dysfunctional structures. They act as pervasive schema perpetuation processes due to the reinforcing effect associated with schema avoidance (Young et al., 2003). If individuals avoid, suppress, overcompensate, or transform the dysfunctional affective pain embedded in maladaptive schemas they are blocking it from reaching the consciousness level that allows cognitive and affective restructuring associated with schema healing (Young et al., 2003). Thus, that is why early maladaptive schemas mediate the relationship between emotion processing difficulties and the regulation of psychological needs (Faustino & Vasco, 2020c).

Maladaptive coping modes or states of mind are attempts for theoretical unification of coping strategies and defense mechanisms (Dimaggio et al., 2015; Young et al., 2003). The authors state that maladaptive coping modes are psychological elaborations on the three basic instinctive survival strategies or mechanisms of fight, flight, or freeze. Thus, schema modes function as mental instances of overcompensation, avoidance, or surrender, respectively that reflect these three basic responses to perceived

danger (Young et al., 2003). Further, research has consistently supported this conceptualization.

Finally, the notion that coping strategies or defense mechanisms have been conceptualized as maladaptive schema coping modes or states, which prevent the unpleasant affect embedded on maladaptive schemas, has recently received empirical support. Faustino & Vasco (2020c) found that the relationship between emotion processing difficulties and the regulation of psychological needs was mediated by early maladaptive schemas. Furthermore, in the same work, the authors described a hierarchical regression model showing that schemas and emotion difficulties were significant predictors of symptomatology. Emotional processing difficulties have also been previously associated with schema domains (Faustino et al., 2019b). According to previous research and theoretical assumptions, maladaptive schemas, maladaptive coping modes, or states of mind are associated and may contribute to some extent, to emotional processing difficulties. This construct will be described below.

ii. Emotion Processing Difficulties

Rachman (1980) used the term "emotional processing" to describe a mental process wherein emotional experiences are incompletely processed (e.g., not fully experienced, assimilated, or integrated into the self). These emotional experiences for not being symbolized and integrated in the self, become pervasive and embedded in emotional schemas (Greenberg & Goldman, 2019). When these emotional experiences are not assimilated, accommodated (Piaget, 1926) and/or mentalized (Bateman & Fonagy, 2010) in the self, symptoms, such as irrational fears, dysfunctional thoughts, obsessions, and sleep disturbances may occur (Baker et al., 2010). The underlying mechanism is that if individuals do not attribute meaning to their experiences, they are

unable to perform an integration of cognition and emotion, within a coherent episodic memory self-narrative, which is disruptive and fragments the sense of identity and the self (Greenberg & Goldman, 2019). Therefore, the process of meaning-making based on emotional experience is interrupted. Thus, the process of meaning-making based on emotional experience is a core aspect in psychotherapy (Greenberg & Goldman, 2019), and it has been emphasized in several theoretical orientations, such as Emotion-Focused Therapy (EFT; Greenberg & Goldman, 2019), Short-term Psychodynamic Psychotherapies (STPD; Fosha, 2000), Exposure-based Therapies (EBT; Foa & Kozak, 1986), and Cognitive Therapy (CT; Samoilov & Goldfried, 2000).

Emotional processing difficulties may be viewed as the problematic emotional reactions or affectively laden states that individuals feel when emotional activation is painful, unbearable, alienating, or unbearable. These distressful emotional states represent unprocessed affective experiences that lead to psychological suffering (Elliott et al., 2004; Greenberg, 2015). According to Elliott and colleagues (2004), these emotional processing difficulties stem from *maladaptive emotional schemes* which are rigid, severe, pervasive and disrupt the process of meaning-making from emotional experience.

In the EFT model (Elliott et al., 2004), six core emotional processing difficulties are targets for specific therapeutic tasks: (1) problematic reaction (puzzling overreaction to situations), (2) unfinished business (resentment or bad feelings related to significant other), (3) absence of meaning (lack of understanding of emotional experience), (4) self-interruption split (avoidance of internal experience), (5) self-critical (internalized critical voice), and (6) vulnerability (painful emotions). Thus, these markers call for specific therapeutic tasks focused on the facilitation of emotional processing that is impaired due to these difficulties (e.g., empty-chair work for unfinished business, experiential focusing

for the absence of meaning or emphatic affirmation for vulnerability). Thus, these emotional processing difficulties call for a marker-guided approach tothese painful emotional states which emerge in a moment-to-moment temporal configuration (Greenberg, 2015; Pascual-Leone & Greenberg, 2007).

Previous research gave substantial support to the previously stated theoretical assumptions, especially with the relationships between schemas and emotion processing difficulties. Recently, Faustino and Vasco (2020c) found that early maladaptive schemas are significant mediators of the relationship between emotion processing difficulties and the regulation of psychological needs. Also, they found through a hierarchical regression analysis that an integrative composite model with the disconnection and rejection and impaired domains of schemas and self-interruption split markers explained the variance in a psychiatric sample. Faustino et al., (2019) described positive medium to strong correlations between all schema domains (e., disconnection, and rejection) and four emotional processing difficulties (e.g., problematic reaction self-interruption split). Saariaho and colleagues (2015) also found positive correlations between alexithymia and several early maladaptive schemas.

Moreover, Kealy and colleagues (2011) described that unprocessed or unregulated emotions tend to impair object relations. Baker et al., (2011) shows that difficulties in emotion processing positively correlated with psychiatric symptoms and alexithymia. Thus, emotion processing difficulties may be related to (Luminet et al., 2018) and emotion dysregulation (Castelo Branco, 2016) and or emotion regulation difficulties (Gratz & Roemer, 2004). Moreover, emotion processing difficulties were negatively correlated with cognitive reappraisal and positively correlated with suppression (Castelo-Branco, 2016) and were negatively correlated with the regulation of psychological needs in a nonclinical and clinical sample (Barreira, 2016; Castelo-Branco, 2016). Thus, these

results may support a transdiagnostic perspective of the emotion processing difficulties construct due to significant correlations beyond diagnosis in the two samples (Barlow et al., 2017).

This evidence sheds some light on the relationship between emotional processing difficulties and other psychological constructs, which means that these difficulties are associated with other variables and may play a wider role in psychological functioning (Faustino & Vasco, 2020c). However, this research is focused on the exploration of the relationships between emotional processing difficulties and schematic functioning, which is theoretically and empirically related.

As stated before, maladaptive schemas may have different configurations and components, but they all share commonalities (e.g., cognitions, needs, emotions), which are thematically and structurally related. For instance, a *cognitive schema* may have memories, attributions, and beliefs which are emotionally laded (e.g., defectiveness schema: "*I am unworthy, because of the bullying that I suffered"*). An emotional schema may also have memories and images which have some meaning attached (e.g., non-acceptance of emotions schema: "*I can´t stand what I feel, and this makes me a weak person"*). An interpersonal schema may have some form of emotionality attached (e.g., social relatedness schema: "*They are always rejecting me*"). Therefore, it is possible to argue that all schemas may encompass to some degree any form of emotional processing difficulties. Therefore, according to these studies, it is possible to raise questions about causality relationships between early schemas, emotion processing difficulties, and symptomatology.

iii. Dysfunctional Interpersonal Cycles

Human beings are a social species and live almost their entire lives in complex social contexts developing several short-term and long-term relationships that contribute, partially, to their life satisfaction and emotional fulfillment. In this sense, repeated interactions form stable relationship patterns that can be functional or dysfunctional, leading to intense subjective suffering and personality malfunction throughout life (Benjamin, 2006, 2018; Safran & Murran, 2000). Therefore, from an integrative and transtheoretical case conceptualization, these relational patterns can be objectively identified, being an asset for differentiated psychological intervention. Concomitantly with the concept of interpersonal schemas, the identification of relational cycles has been a subject of attention of different theoretical approaches, such as Attachment-Based Therapy (ABT, Dozier, 2003), Alliance-Focused Therapy (AFT; Safran & Murran, 2000), Metacognitive Interpersonal Therapy, (MIT; Dimaggio et al., 2015), Interpersonal Reconstructive Therapy (IRT; Benjamin, 2018), Schema Therapy with Couples, (ST-C; Simeone-DiFrancesco, et al., 2015) and Brief-Dynamic Relational Therapy (BDRT; Körner et al., 2004).

Dysfunctional interpersonal cycles are the subjective interactional patterns that occur between individuals, typically outside their perception, and which tend to reinforce previous relational attitudes and postures (Benjamin, 2018; Dimaggio et al., 2007; Safran & Murran, 2000). Dysfunctional interpersonal cycles are behavioral interpersonal manifestations driven by the beliefs, motivations, perspective, and intentions organized and internalized in stable mental structures (e.g., interpersonal schemas). In this sense, interpersonal schemas shape subjective interpersonal interactions that tend to engage in reciprocal cycles that are then internalized and reshape schematic functioning (Dimaggio et a., 2015; Faustino & Vasco, 2020a). Individuals driven by their interpersonal schemas

engage in cyclical and reciprocal interactions with others which tend to give a sense of prediction and familiarity with current relationships. Some examples will be given below to illustrate this phenomenon. Although, it is important to differentiate the concept of an interpersonal schema from the concept of a dysfunctional interpersonal cycle. Interpersonal schemas are *intrapsychic stable structures* that organize several elements of experience and determine perceptions and behavior, while dysfunctional interpersonal cycles are the *intersubjective processes* that occurs between individuals. In this sense, interpersonal schemas are the main sources of dysfunctional cycles.

Several authors have developed different conceptualizations of these types of intersubjective relational processes, which warrant a brief description, so as to illustrate this complex construct. Dimaggio and collaborators (2007) stated that specific *interpersonal dysfunctional cycles* can be identified in several personality disorders. It is stated that narcissistic personality disorder has relational cycles of superiority/inferiority, attention-seeking/other dismissive and mutual idealization; Avoidant personality disorder has typically cycles of alienation/extraneousness, inadequacy/rejection, and constriction/avoidance; Dependent personality disorder has cycles of chaotic/dysregulated, dependent/subservient and sadomasochistic. Finally, borderline personality disorder has the invalidating/alarm cycle (Dimaggio et al., 2007, 2015). However, these assumptions remain empirically untested.

Safran and Murran (2000) described the *interpersonal cognitive/affective cycle* as a set of interactions between *the self-other* domain that reflects the patterns that individuals maintain through standard attributions and expectations relative to the intentions of the other. In the psychotherapeutic *alliance rupture model,* they emphasized the *confrontation* and *avoidanc*e markers, calling the *metacommunication* task to resolve them (Saffran, 1990; Safran & Murran, 2000). In Schema Therapy for Couples, based on

schema modes of overcompensation, avoidance or surrender, Simeone-DiFrancesco and colleagues (2015) suggested five-mode cycles which represent reciprocal patterns, such as overcompensation/over compensator, over-compensator/detached self-soother, over-compensator/detached protector, detached/detached and over-compensator/surrender. Benjamin (2006, 2018) uses an interpersonal framework based on Structural Analysis of Social Behavior (SASB, Benjamin, 1974), which is a conceptualization of interpersonal problems, with a focus on self domains as *self-self*, *self-other* and *other-self*. The SAAB model also conceptualizes two axes as affiliation and interdependence, with polarities of love-hate and emancipate-control, which is used to understand social interactions between individuals (Benjamin, 2018).

Körner et al., (2004) combining the SASB (Benjamin,1974) with Core Conflictual Relationship Theme (CCRT, Luborsky, 1977), conceptualized four basic interpersonal configurations of similarity, complementarity, opposition, and antithesis. These configurations were then framed in terms of (1) the subject's expectations of his their behavior and (2) the behavior of others, and (3) attributions of meaning and internal action tendencies arising from these interactions. The Authors defined three factors: positive giving and taking, self-affirmation/retaliation, and formative reaction. Also, two factors were differentiated as well (internalization/punishment and self-care/integrity), which reflect the relational intersubjective processes (Körner et al., 2004).

Due to different conceptualizations of dysfunctional interpersonal cycles, research on this subject is somewhat fragmented and in need of some form of unification. Previous research showed that interpersonal dysfunctional cycles inferred from relational patterns questionnaires appear to be positively associated with depressive symptomatology, low self-esteem, relational difficulties (Benjamin, 2013, 2018), personality disorders such as histrionic, narcissism, avoidant and schizoid disorders (Dimaggio et al., 2015, 2017;

Scarvalone et al., 2005). Interpersonal dysfunctional cycles are also found to be related to the history of sexual abuse and with psychological health (Körner et al., 2004, 2006; Scarvalone et al., 2005). Moreover, relational patterns were previously associated with cognitive fusion (Faustino & Vasco, 2020a), defensive styles (Martins, 2016), and the regulation of psychological needs (Faustino & Vasco, 2020a; Martins, 2016).

Concluding thoughts and articulation

Individuals deal with emotional suffering in different ways. However, it is not clear if defensive styles and coping responses are two sides of the same process. It makes some sense that if emotional suffering and the related theme in memory are conscious, individuals use some explicit coping behaviours to deal with it. But if the emotional suffering is related to an unconscious motive, maybe individuals engage in automatic defences that are outside of awareness. Thus, maybe emotional processing difficulties and interpersonal dysfunctional cycles are somewhat associated with implicit and explicit schema processing. It not clear what associations there are between schemas, defensive manoeuvres, and dysfunctional consequences. However, this hypothesis will be explored and detailed further.

c. Mental Skills and Adaptive Processes

Individuals come to psychotherapy as human beings, with their strengths and vulnerabilities, with their life histories, narratives, and wishes. Individuals are far more than a cluster of symptoms or a psychological disorder. Several authors argue that a comprehensive case conceptualization must not only focus on the dysfunctional factors of the maladaptive psychological functioning but also on the adaptive factors that

individuals bring to psychotherapy. Thus, resilience or protective factors are an integral part of most case conceptualization frameworks across different theoretical orientations (Norcorss & Lambert, 2019; Vasco, 2001, 2005; Vanderbilt-Adriance & Shaw, 2008). Protective factors may assume different configurations, such as secure attachment, peer support, family stability, good physical health, temperamental traits and adaptive states of mind (Cloninger et a., 2010, Faustino et al., 2021b; Rolf et al., 1990). Furthermore, the *mental skills and adaptive processes* that will be covered, conceptualized, and described here are theoretically and empirically driven (Faustino et al., 2019a,b; Faustino et al., 2020a).

i. Metacognition, psychological flexibility, and emotion regulation

Mental abilities that allow humans to update their views, perspectives, needs, goals, and problem-solving skills regarding oneself and others rely on three major psychological variables: metacognition, psychological flexibility, and emotion regulation (Faustino et al., 2019a; Faustino, 2020). Research showed that these three variables are intrinsically connected and are compromised in several psychological disorders (Faustino, 2019a, 2020; Dimaggio et al., 2015; Lehay, 2015; Hayes et al., 2013). Thus, in DSM-IV, inflexibility is a diagnostic criterion for personality disorders. However, some empirical data suggest that these two variables may be independent of diagnosis, which means that they may be transdiagnostic. I will start by introducing metacognition and then I will move to psychological flexibility.

Similar to psychological constructs previously described in the present work, metacognition is a term that has similarities with other constructs, mainly due to different lines of research (Pedone et al., 2017). Psychological constructs such as mentalization (Bateman & Fonagy 2013), affect consciousness (Solbakken et al., 2012), alexithymia (Lumley et al., 2007), metacognitive beliefs (Wells, 2000), the theory of mind (Premack

& Woodruff, 1978) or social cognition, (Fisk & Fisk, 2017) all rely on some form of "mind-reading abilities". However, there is an integrative metacognitive model that has recently received some clinical and empirical support.

The Metacognitive Multi-Function Model (MMFM, Semerari, et al., 2003), describes metacognition as a set of psychological and neuropsychological processes that allow individuals to understand their mental states and the mental states of others which underly expressive behavior (Semerari et al., 2003). This model stresses not only the functional aspect of metacognition (e.g., identify, describe, and reflect mental states of self and others) but also the mental factors or domains in which these processes will function (Pedone et al., 2017). Moreover, empirical studies suggest that metacognition may be divided into four major domains, wherein the different cognitive processes may function (Faustino et al., 2019a; Pedone et al., 2017). The first factor was defined as understanding one´s mind (self-self-domain), with abilities of monitoring, identification, integration, and relating variables of different cognitive and affective elements of human experience. The second factor was defined as differentiation-decentering (critical distance) with abilities of differentiation of cognitive and affective elements and decentering from one's perspectives. The third factor was defined as mastery (expertise) which represents expertise in using mental content in problem-solving. The last factor was defined as understanding others' minds (self-other domain), with abilities of identification, decentering, and relating variables (Faustino et al., 2019a; Pedone et al., 2017; Semerari, et al., 2003). Moreover, mentalization may be viewed as the ongoing processes embed in these four metacognitive domains, which allows individuals to process and reflex on these thematic mental contents. In this sense, the present work regards mentalization as the reflexive compound of metacognition, and they will be conceptualized as the same construct.

Furthermore, this model not only gives an integrative framework for case conceptualization but also illustrates the importance of metacognition on adaptive psychological adjustment and functioning. Thus, several authors state that metacognitive dysfunctions lie at the core of several psychological disorders (Dimaggio et al., 2007; 2015). If individuals have difficulties in identifying, describing, and differentiating perceptions, needs, and beliefs of self and others, they can have a sense of a fragmented, vague, or conflicted self (Dimaggio et al., 2015). If individuals cannot differentiate and take an internal critical distance from the experiential self to the reflexive self, they will have difficulties in the cognitive-affective processing of mental elements (Faustino et al., 2019). And if individuals cannot apply metacognitive knowledge in everyday problems, they will face several barriers to psychological adjustment (Faustino et al., 2019a; Pedone et a., 2017; Semerari, et al., 2003).

Moreover, metacognitive deficits have been found in emotional disorders (Wells, 2000), maladaptive coping modes and psychological needs (Gonçalves, 2020), difficulties in affect regulation (Harder & Folke, 2012), poor social functioning (Bo et al., 2015), personality disorders (Dimaggio et al., 2015), schizophrenia (Dimaggio & Lysaker, 2010), learning disabilities (Lucangeli et al., 1998) and autism spectrum disorders (Grainger et al., 2014). Furthermore, metacognitive deficits were also found in executive dysfunctions (Lysaker et al., 2008) and neurocognitive domains of the speed of processing, visual, and verbal memory (Nicolo et al., 2012). Thus, this suggests that metacognition may be a strong candidate to be regarded as a neurocognitive domain, but performance-based tasks based on this model should be developed to test this hypothesis.

A recent study has documented the relationship between metacognition and psychological inflexibility, which is another aspect of this sub-chapter. Faustino and collaborators (2019) described that cognitive fusion (as a measure of psychological

inflexibility) showed a medium to strong negative correlation with *understanding one's mind*, *understanding other's mind,* and *decentering – differentiation* from the MMFM. The same study described that cognitive fusion was strongly positively correlated with *negative beliefs, cognitive self-consciousness, cognitive confidence, positive beliefs and need for control,* which are all regarded as maladaptive metacognitions from the Self-Regulatory Executive Function (SREF, Wells, 2000; Wells & Mathews, 1994). Regarding the MMFM domains, one could argue that for individuals to be able to identify, describe and differentiate mental elements of self and others, and to distance themselves from their perspectives, in order to solve problems, they need to have, to some extent, several degrees of psychological flexibility that allow them to adapt to changing internal and environmental demands. Especially, if they need to reappraise some emotionally-laden situation (Faustino et al., 2020a). Therefore, these results suggest an intrinsic association between metacognition and psychological inflexibility.

Psychological flexibility may be described as how individuals adapt to situational demands, reconfigure mental abilities or resources that allow them to shift perspectives and to solve problems regarding conflicting needs and desires through several life areas (Kashdan & Rottenberg, 2010). Psychological flexibility may also be described as the ability to stay focused on the present moment despite unpleasant experiences and to behave in accordance with the context and personal values (Hayes et al., 2011). These two definitions imply that this construct is a core aspect of mental health and there is a substantial amount of research supporting this assumption.

Psychological inflexibility is associated with psychological distress (Bardeen & Fergus, 2016; Krafft et al., 2019), symptomatology (Gillanders et al., 2014), impairment of emotional differentiation (Plonsker et al., 2017), and early maladaptive schemas (Faustino & Vasco, 2020b). In this latter study, Faustino and Vasco (2020b) found that

cognitive fusion was a significant mediator of the relationship between early maladaptive schemas and the regulation of psychological needs. Also, Faustino (2020) emphasized the transdiagnostic character of emotion dysregulation domains and psychological inflexibility associated with emotion regulation strategies, which may also validate the transdiagnostic value of psychological inflexibility (Levin et al., 2014).

Finally, as described before, metacognition and psychological flexibility may be viewed as two core aspects of mental health and may be differentiated targets for psychological intervention. From an integrative perspective and along with the main conceptualization described here, metacognition may be regarded as composed of four domains (e.g., self-self) in which several metacognitive functions operate (e.g., identification and differentiation). For these operations to function adaptively, the metacognitive system requires some degree of psychological flexibility, so that the individual is able to adapt to situational demands and reconfigure mental abilities or resources that allow shifting perspectives and solving problems. Therefore, metacognition may be regarded as a cluster of mental domains, and psychological flexibility is an intrinsic feature of all mental processes in the metacognitive system. Nevertheless, according to Dimaggio and collaborators (2015), affective states have a powerful impact on metacognition, which is why individuals must also have several adaptive mental stances such as self-compassion, acceptance, and mindfulness.

ii. Acceptance, mindfulness, and compassion

Since the late 1990s, several approaches have emphasized the explicit role of acceptance, mindfulness, and compassion in promoting psychological flexibility, accepting distressing private experience, and softening internal criticism. These types of therapies were referred to as third-generation CBT, which focused on the mechanisms of

change underlying the relationships between the self and private events, rather than changing the self or the private events (Gilbert, 2010; Hayes et al., 2011; Linehan, 1993; Segal et al, 2013).

These three constructs have several similarities and overlaps. However, one core aspect of overlap between these constructs is that they are are strongly related to the regulation of psychological needs (Faustino et al., 2020a; Jorge, 2020), life satisfaction (Chamberlain & Haaga, 2001), psychological wellbeing (Gilbert, 2004; Neff, 2004), psychological flexibility and mental health (Marshall & Brockman, 2016). This evidence supports the notion that these three constructs may be regarded as core aspects of a facet of the self which may be defined as adaptive or health self (Dimaggio et al., 2015; Young et al., 2003). Thus, Faustino and colleagues (2020) found empirical support for a cluster of adaptive states of mind that explained a higher degree of variance of symptomatology that dysfunctional self-states. However, acceptance, mindfulness, and compassion may also have different aspects and may correspond to different mental stances.

Unconditional self-acceptance from Rational Emotional Therapy (REBT; Ellis, 1994), and self-acceptance from Acceptance and Commitment Therapy (ACT; Hayes et al., 2011), despite their orthographic similarities, have slightly different definitions. Unconditional self-acceptance, according to the REBT literature, is defined as a disposition to assess self-worth or ability to fully accept his/herself, disregarding the outcome (Chamberlain & Haaga, 2001). Self-acceptance in the ACT literature is defined as the capacity to be in contact with private and internal experience, in a non-judgmentally way to process thoughts and feelings (Hayes et al., 2011). These two definitions imply two different aspects of mental functioning: an attitudinal aspect and a mental skill, which may overlap with mindfulness, as will be further elaborated. However, what is important here is that acceptance may be viewed as an adaptive facet of the self that may be

extremely important in the emotional processing of internal private experiences (Faustino et al., 2020; Hayes et al., 2011). Moreover, unconditional self-acceptance has been positively associated with mental health and higher levels of life satisfaction, and negatively associated with anxiety and depression, symptomatology and low self-esteem (Chamberlain & Haaga, 2001). Also, the lack of unconditional self-acceptance is a significant predictor of depression (Popov et al., 2016), anxiety, and low levels of life satisfaction (Popov, 2019). In the ACT tradition, self-acceptance and cognitive defusion are regarded as opposite processes of experiential avoidance and cognitive fusion, which are associated with emotional dysregulation domains and strategies (Faustino, 2020), early maladaptive schemas and interpersonal dysfunctional cycles (Faustino & Vasco, 2020a; 2020b), and anxiety, depression and psychological distress (Gillanders et al., 2014; Bardeen & Fergus, 2016).

Furthermore, as stated before, the ACT definition of self-acceptance may overlap with mindfulness definitions, which is why a measure focused on unconditional self-acceptance was chosen in the present work. Thus, mindfulness may be defined as the capability to center attention on internal experience with an accepting and non-judgmental attitude (Kabat-Zinn, 1994). It stresses the importance of a higher awareness of internal moment-to-moment states and looking at thoughts and emotions from a decentered point of view, seeing mental events as subjective rather than objective depictures of the self and reality (Segal et al., 2013; Kabat-Zinn, 1994). This definition is very similar to the previous definition of self-acceptance from ACT literature. Therefore, a differentiation should be made. In this model, mindfulness represents a mental ability to be focused on internal experience and pay attention to experience. Acceptance is regarded as the attitudinal component of the self that allows individuals to accept their internal experience rather than reject it. In this sense, mindfulness is regarded as an

adaptive mental skill and self-acceptance as an adaptive attitude (Hayes et., 2011), state

of mind (Faustino et al., 2020), or an adaptive schema (Bach et al., 2017) towards the self.

Moreover, despite small but detectable effects, several meta-analytic studies support the

assumption that mindfulness is an adaptive mental domain (Demarzo et al., 2015;

Hofmann et al., 2010; Treves et a., 2019). Finally, the main proponents of the use of

mindfulness are the Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1994) and

Mindfulness-Based Cognitive Therapy (MBCT; Segal et al., 2013).

Neff (2003) defines self-compassion as a warm/kind attitude in the acceptance of

self-negative aspects involving: (1) warm/comprehension towards the self, (2)

understanding experiences as a larger experience of humanity, and (3) conscious

acceptance of feelings and actions. Again, this definition also alludes to some form of

acceptance. However, Gilbert (2005), focusing on the evolutionary aspect of compassion,

states that compassion is associated with motivations (need to take care of the other),

emotions (ability to detect discomfort), behavior (ability to tolerate discomfort rather than

avoiding it) and cognition (comprehending the cause of discomfort and dealing with it).

These two definitions may be complementary and may support the notion that self-

compassion is an adaptive mental domain. Thus, previous research showed positive

correlations between self-compassion and exploration, wisdom, personal initiative, social

connectivity, extroversion, optimism, pleasantness, curiosity, happiness and

conscientiousness and affectivity (Neff et al., 2005), Also, self-compassion was found to

be negatively associated with emotional schemas (Faustino et al., 2020), depression,

anxiety, self-criticism and negative affectivity (Neff et al., 2005). Macbeth and Gumley

(2012) reported in a meta-analytic study several negative associations between self-

compassion and psychopathology, especially with anxiety and depressive symptoms

(Costa & Pinto-Gouveia, 2011; Raes, 2011; Gilbert et al., 2011), and distress symptomatology (Raque-Bogdan et al., 2011).

Along with this documented evidence, two previous studies support the conceptualization of acceptance, mindfulness, and compassion as conceptually related: a study focused on states of mind and a study focused on the relationships between emotional schemas and acceptance, mindfulness, and compassion (Faustino et al., 2020ab). In the first study, four complex states of mind were conceptualized as domains belonging to an adaptive or healthy self. These four states of mind were defined as: interpersonal connectiveness/belonging; self-trust/integrity; acceptance/mindfulness; self-compassion/emotional fulfillment. These states matched the domains of acceptance, mindfulness, compassion, and attachment. The authors found empirical support for positive correlations between these complex states of mind and the healthy self domains, while also finding a negative correlation between these states and symptomatology (Faustino et al., 2020a). In the second study, it was also documented that acceptance, mindfulness, and compassion are strongly correlated between themselves and are strongly correlated with the regulation of psychological needs. Thus, in the same study, two mediation models were documented. The first model described that self-compassion was a significant mediator of the relationship between emotional schemas and symptomatology. The second model described that mindfulness and compassion were significant mediators of the relationship between emotional schemas and the regulation of psychological needs (Faustino, 2020b). In this sense, it is justified to assume that acceptance, mindfulness, and compassion are theoretically and empirically associated (Faustino et al. 2020a, b; Hayes, et al., 2011; Thim, 2017). Thus, Thim (2017), documented positive correlations between self-compassion and mindfulness and negative correlations with early maladaptive schemas, which also supports this conceptualization.

Furthermore, from a comprehensive and integrative case conceptualization perspective, acceptance, mindfulness, and compassion belong to an adaptive or healthy self-domain, but they represent different elements of it. Mindfulness is the ability to focus and maintain the attention on internal experience in a moment-to-moment manner, while acceptance and compassion are related with self-dispositions or tendencies of self-worth/acceptance and warmth and kindness, comprehension, and human inclusivity, which are highly associated with life satisfaction (Neff et at., 2005), psychological well-being (Zessin et al., 2015), and with the regulation of psychological needs (Faustino et al., 2020a; Jorge, 2019). Moreover, Kirby and colleagues (2017) stated that mindfulness and compassion are strongly related, and that they are clear targets for psychological intervention.

Concluding thoughts

Mental skills and adaptive processes are essential mental domains that may underly resiliency and may be viewed as core targets for therapeutic stimulation. Processing of mental elements is dependent on a functionally interconnected network of these process. Metacognition is an essential cluster of mental skills that humans require to process self- and other-related contents. Cognitive and affective processing modes need flexibility to disentangle from past stimuli and focus on new stimuli, which is why psychological flexibility may be an intrinsic feature of metacognitive processing. Thus, results from the study of Faustino and colleagues (2019a) seem to point in that direction. Moreover, the articulation of these adaptive mental elements configures a new perspective regarding the integration of metacognition, psychological flexibility, and emotion regulation with acceptance, mindfulness, and compassion.

4. *Affective neuroscience and neurocognitive functioning applied to psychotherapy*

The essentials justifying an integrative view between neurobiology and psychotherapy were described previously. The upcoming recognition of the reciprocal roles that brain and behavior play in shaping human subjectivity, reflects the increasing awareness that adaptation and disorder theories may be augmented if both perspectives are taken into account (Cozolino, 2017; Grawe, 2005; Panksepp, 1998; Siegel, 2012). This is not only true for the development of parsimonious and comprehensive theories explaining psychological malfunctioning, but also for postulating specific therapeutically principles that therapists should incorporate in their practice. Thus, therapeutic brain-based principles may also function as a neutral foundation for theoretical integration across different theoretical approaches. Those principles were emphasized in chapter one and represent a practical and direct application of scientific outcomes of applied neurobiological and neurosciences research focused on human affective experience and social behavior (Cacioppo & Cacioppo, 2013; Cozolino, 2017; Grawe, 2005; Panksepp, 1998; Siegel, 2012; Tryon, 2014).

If we assume that when psychotherapy results in symptom reduction, cognitive/affective restructuring, skill development, and adaptive interpersonal proximity, the brain has, to some degree, changed, it is important to understand by which structures and/or mechanisms that change occurred (Cozolino, 2017; Siegel, 2012). Kandel (1998) emphasized that psychotherapy is the *brain-treatment* by definition because the quality of the therapeutic relationship activates our experience-dependent plasticity mechanism which in turn shapes our neural networks. Thus, the nature of our experiences and interpersonal relationships becomes encoded in complex neuronal systems, distributed through several areas (e.g., orbitofrontal cortex, hippocampus),

which are responsible for our sense of self, decision-making, and affective regulation (Damasio & Damasio, 1994; Panksepp, 1998). However, brain processes are extremely complex, and as research suggests, some of them may give clear contributions to psychotherapy. In this sense, to better understand how the brain processes information and how these processes impact the development of executive functioning, subjective experience of the self, and affect regulation, the present chapter is focused on the following three major subchapters: (1) neurocognitive functions and neuronal integration, (2) neurobiological contingencies of affective and interpersonal interactions and (3) Non-conscious affective processing.

The first subchapter is called *neurocognitive functions and neuronal integration*, and will be divided into three topics: (i) from neural networks to subjective experience, (ii) executive functions and the frontal lobe, and (iii) memory and complex attention. In the first topic, a brief review of how neural networks give rise to subjective experience will be presented to contextualize complex neural networks and how they encode and translate subjective experiences into the human internal world (Cozolino, 2017). The second topic will be focused on how executive functions may be viewed as a cluster of core neurocognitive processes for optimal brain functioning. Finally, the last topic will be focused on memory and complex attention, which are major aspects of the neurocognitive functioning that supports human experience (Lezak et al., 2014). Based on empirical evidence, I argue that these neurocognitive domains may be an asset in integrative case conceptualization.

The second subchapter is called *neurobiological contingencies of affective and interpersonal interactions,* and it will be divided in three topics: (i) epigenetics, neuronal plasticity, neurogenesis and mirror neurons, (ii) underlying neurobiology of schemas and emotional states, (iii) default mode network and the self and (iv) nonconscious affective

processing. The first topic will be focused on how *epigenetics, neuronal plasticity, neurogenesis, and mirror neurons* contribute to how humans learn and experience interpersonal relationships, which are a core aspect of psychotherapy. The second topic is focused on the *default mode network,* which is a hypothesized complex neurobiological and neuronal structure for the experience of the *self.* Finally, the third topic will be focused on *non-conscious affective processing,* and how it can be understood through dual-route models, and how it impacts attentional bias. These topics were clustered together because research suggests that interpersonal relationships are an intrinsic part of the experience of the self and a core aspect of affective processing. Thus, restructure maladaptive interpersonal relationships, to allow the development of new self-views, and to increase affect regulation skills, may be core aspects in psychotherapy (Cozolino, 2017; Grawe, 2005; Kandel, 1998; Siegel, 2012; Tryon, 2014).

a.   Neurocognitive functions and neuronal integration

Neurocognitive functions are key processes that allow human beings to make sense of the internal and external world through multimodal processing (Diamond, 20013; Cozolino, 2017; Grawe, 2007; LeDoux, 2002; Tyron, 2014). These processes are strictly associated with cognitive, affective, behavioral, and interpersonal behaviors, as they lie at the core of human information processing. Neurocognitive functions develop from an early age to adulthood through the interaction between genes and environment. However, they need environmental stimulation with stage congruent challenges and tasks to fully acquire their effectiveness. Number of years of education is highly correlated with neurocognitive performance (Faustino et al., 2020c). This subtopic will be divided as follows: (i) from neural networks to subjective experience, (ii) executive functions and the frontal lobe, and (iii) memory and complex attention.

i. From neural networks to subjective experience

The complexity of the interplay between mind and brain raises different questions and assumptions that cut across different levels of explanation and scientific fields. Psychotherapy and neurology give different descriptions and explanations when it comes to describing how the brain and mind influence adaptive or maladaptive behavior (Tyron, 2014). However, a basic assumption regarding mind-brain relationships is that adequate neuronal and psychological functioning depends on an optimal level of development/growth, differentiation, stimulation, integration, complexity, and consistency (Cozolino, 2017; Grawe, 2007; LeDoux,2002). These processes may also be described on different levels of explanation and or abstraction.

On a neurological level, the development/growth of neuronal systems depends on the consistent stimulation from the environment which will promote the differentiation, communication, and integration of multimodal complex neuronal networks dedicated to emotion, cognition, sensation, perception, and behavior, along with proper excitation and inhibition (Cozolino, 2017; LeDoux, 2002). On an experiential level, adequate psychological development/growth, differentiation and integration are core aspects in explaining how humans can feel, think, get connected, and enjoy life without lifelong pervasive maladaptive patterns and the use of inflexible defensive maneuvers (Cozolino, 2017). Moreover, these aspects are promoted through a consistent, rich, and stimulating early environment, with adequate stage challenges, secure attachment with support, protection, stability, consistency, and adequate expression of love and affection from parents (Cozolino, 2017; Grawe, 2007; Siegel, 2012; Young et al., 2003). The integration of these two domains leads to the development of affect regulation skills, a neuroendocrine and homeostatic calibration, and the development of a true sense of self and subjectivity (Cozolino, 2017; Grawe, 2007).

The importance of a trusting and safe environment combined with warmth and responsive attachment relationships is a common feature in neuroscience and psychotherapy for optimal development (Cozolino, 2017; Etkin et al., 2005; Kandel, 1998). Thus, from a neuroscience perspective psychotherapy may be regarded as a specific type of relationship where through a supporting and safe environment neuronal plasticity is stimulated along with the development of new neuronal networks and their integration in more complex neuronal structures of emotion, cognition, and perception (Cozolino, 2017; LeDoux, 2002). Thus, several therapeutic techniques may have different effects on the stimulation of the development of different neuronal networks (Tyron, 2014). However, the therapeutic relationship seems to be the common denominator between several theoretical orientations when it comes to the stimulation, development, and integration of new neuronal networks that support the subjective experience. This may be achieved because the therapeutic relationship is: (1) a safe, supporting, and trusting relationship, (2) promotes the activation of mild to moderate stress, (3) promotes the integration of both emotion and cognition, and (4) facilitates the elaboration of new and more adaptive self-narratives (Cozolino, 2017; Grawe, 2007).

Psychotherapists encourage clients to express emotions, reflect on past experiences, and take new perspectives about themselves and others in a safe, warm, stable, and judgment-free environment, which is the therapeutic relationship. Psychotherapists guide individuals back and forth between feelings and thoughts, between memories and past experiences, between needs and previous learnings, and promote consistently the establishment of new connections between these psychological elements (Cozolino, 2017; Grawe, 2007). Through perspective-shifting/decentration, exposure, validation, behavioral rehearsal, and cognitive/affective differentiation psychotherapists are promoting the activation of cognitive and affective neuronal

networks which were previously dissociated and are promoting the development and the integration of new networks (Cozolino, 2017; Siegel, 2012). These processes help patients to become aware of several parts of themselves and how they are communicating with themselves and with others. Thus, these processes, by being brought to a conscious level, may become, in part, controlled by the executive functions, which are key processes in multimodal operations. Also, when these processes are acknowledged adequately they promote self-awareness, emotional attunement, inner transformation, resilience, and enhance the decision-making process, which is a core aspect of subjective experience (Cozolino, 2016, 2017; Grawe, 2007; Greenberg, 2015).

There seem to be five major neuronal networks specifically related to psychotherapy: (1) Left hemisphere language network (LFLN), (2) Salience network (SN), (3) Amygdaloid-hippocampal memory network (AHMN), (4) Frontal-parietal executive network (FPEN), (5) Default mode network (DMN). The Left hemisphere language network (LFLN) is composed of portions of the frontal, temporal, parietal and occipital lobes (Wernicke, Broca, and arcuate fasciculus) and is not only responsible for language interpretation and production but also for synthesizing available information to generate a coherent narrative of the conscious social self (Cozolino, 2017; Cacioppo & Cacioppo, 2013). The salience network (SN) is composed of the prefrontal cortex, anterior cingulate cortex, and the insula, and is responsible for choosing and maintaining the focus of attention on the most relevant internal and external stimuli, to guide emotional and interpersonal processing (Menon & Uddin, 2010). The Amygdaloid-hippocampal memory network (AHMN) is composed of the amygdala and the hippocampus, being responsible for the encoding and storing of explicit memory and learning, along with emotional learning (Kandel et al., 2013). The Frontal-parietal executive network (FPEN) is composed of the dorsolateral prefrontal cortex, the superior

and inferior parietal lobes, the anterior cingulate cortex and some regions of occipital and temporal lobes, which are responsible for the executive functioning (Costa & Averbeck, 2013). The Default mode network (DMN) is composed of the medial prefrontal cortex, medial temporal lobe, hippocampus, posterior cingulate cortex, and precuneus region, and is thought to be the neuronal network of the self (Brucker & DiNicola, 2019; Cozolino, 2017).

The Triadic Neural Psychopathological Model (Menon, 2011) states that the malfunctioning of the SN, FPEN and DMN may be responsible for psychiatric and neurological conditions such as schizophrenia, autism, or frontal-temporal dementia - see *figure 1*. In line with this model, Faustino (2021) based on an literature review identified a Neurocognitive Psychological Syndrome in several psychopathological conditions, such as anxiety, depression and schizophrenia. The literature review revealed that individuals with these psychopathological conditions showed difficulties in response modulation/inhibition, selective attentional inflexibility, stereotypical autobiographical memory patterns, and fluctuations in the sense of self and boundaries of others, which could be attribute to impairments in SN, AHMN FPEN and DMN (Faustino, 2021).
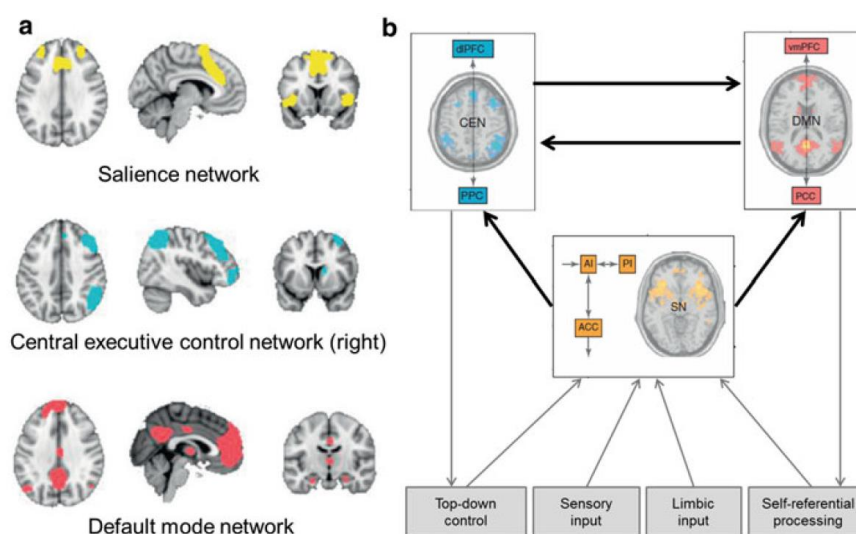

Figure 3. Triadic Neural Psychopathological Model (Menon, 2011).

Why is this so important in the present work? As stated in the previous chapters, the present works aim to develop a new ontological perspective that supports a parsimoniously integrative disorder theory and case conceptualization. This research suggests that the integration of a psychological, neurocognitive and neurobiological perspective of human behavior can be an asset to achieve this goal. Therefore, it is essential to understand what is happening not only during a human maladaptive developmental trajectory at the psychological and neurological level but also what is happening during a psychotherapy process, which is why both levels were emphasized. Thus, the present work encompasses several psychologically and neuroscience-based measures to explore these associations, specifically at the emotional level. This will be elaborated in subsequent chapters. Finally, development and integration may be described through different levels (neuronal and psychological) and the therapeutic relationship is regarded as a privileged type of relationship wherein inner transformation may occur, *from neuronal networks to subjective experiences*. Furthermore, executive functions are also a fundamental aspect of the understanding of the complex interplay between brain, mind, and behavior, which will be described next.

ii. Executive functions and the frontal lobe

Neuropsychologists and neuroscientists have discovered the importance of executive functions a long time ago, especially when it comes to understanding how individuals regulate their behavior and how they function in their daily life activities (Diamond, 2013; Lezak et al., 2014; Miller & Cummings, 2007; Stuss & Knight, 2013; Zilmer et al., 2008). However, there is a growing interest in the understanding of how executive functions would play a role in psychotherapy and how they can be targets for psychological intervention (Cozolino, 2017; Diamond, 2013). Executive function is a

generic concept that describes a set of higher-order neurocognitive processes that modulate other cognitive processes, and which can be automatic or deliberate (Miller & Cummings, 2007; Stuss & Knight, 2013; Zilmer et al., 2008). These processes tend to be associated with the frontal lobe and are core aspects of goal-directed behaviors (Miller & Cummings, 2007; Stuss & Knight, 2013). There are several functions that are described as executive functions, namely: cognitive flexibility, prioritizing, organization and categorization, verbal fluency, updating, inhibition, and abstract reasoning (Miller & Cummings, 2007). However, different authors gave different emphasis to different aspects of these functions. One influential model that may help to understand why executive functions may be important for psychotherapy is the model of Lezak and colleagues (2014), which captures the complexity of these processes.

For Lezak and colleagues (2014), executive functions are constituted by four conceptual components (volition, function, action with purpose, and effective performance), each involving several functions oriented to several contextualized components. The correct articulation between executive processes and contextual components is essential for appropriate, self-regulated, and socially responsible conduct. Thus, volition refers to the set of complex processes that determine the individual's needs and desires and their conceptualization, in a future-oriented way aimed at their satisfaction (Lezak et al., 2014). The next one concerns the identification and organization of the elements and is necessary to reach a previously elaborated objective (Lezak et al., 2014). Action with purpose aims at translating an intention or a plan into productive activity, by starting, maintaining, changing, and stopping complex composition sequences in an orderly and integrated manner (Lezak et al., 2014). Finally, effective performance translates the cognitive ability to monitor, regulate, and correct the intensity and quality of cognition (Lezak et al., 2014).

Another important model for the conceptualization of executive functions is the three-factor model by Miyake and colleagues (2000). This model was developed through several factor analyses which showed that at the core, there are three fundamental executive processes: set-shifting/flexibility, updating, and inhibition. These three processes correspond to cognitive flexibility, working memory, and the ability to inhibit mental content (Diamond, 2013; Miyake et al., 2000). Several studies were able to replicate these findings which has consolidated the three-factor model of executive functioning as one of the most scientifically accurate representations of executive functions (Miyake & Friedman, 2014). Moreover, in addition to Lezak's (2014) and Miyake and colleagues' (2000) models, it is possible to find other authors with different conceptualizations of executive functioning, namely Baddeley and Hitch (1974) with the working memory model, Norman and Shallice (1986) with the supervisor attentional system model and Damasio (1998) with the somatic markers hypothesis. Finally, other researchers are inseparable from the concept of executive functions due to their contributions to research, such as Lúria (1966), Miller and Cummings, (2007), Stuss and Knight, (2013), and Diamond (2013). Thus, Diamond (2013) elaborated an integrative model of executive functions built on previous notions of low-level and higher-level processes – see figure 2.

Usually, the prefrontal cortex is defined as the brain neuroanatomical structure for the executive functions (Miyake, et al., 2012). However, a functional conception based on the localizationist paradigm, where a structural neuroanatomical specificity is postulated for the executive functions tends towards reformulation (Miller & Cummings, 2007; Stuss & Knight, 2013). Research in behavioral neurosciences, as well as in neuroimaging, has shown the importance of the faculty of executive functioning, as a

product of multimodal information processing systems transversal to the whole brain (Stuss & Knight, 2013; Zilmer et al., 2008).
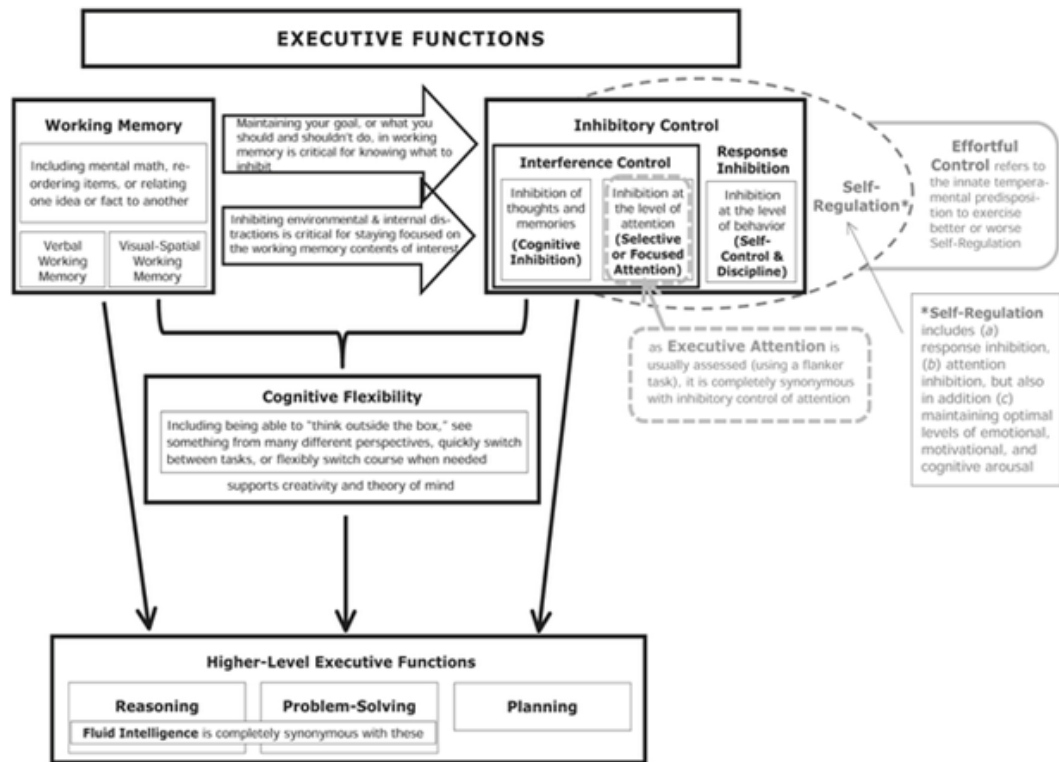

Figure 4. Integrative Model of Executive Functions (Diamond, 2013).

Several investigations have emerged that suggest that executive functions, despite being located fundamentally on the frontal lobes, may depend on a more distributed neuronal network structure, or as stated before, the *frontal-parietal executive network* (FPEN). Thus, cognitive flexibility may be dependent on a set of distributed neuronal circuits, through the parietal and temporal cortex, due to the specificity of the task of categorizing the card and maintaining memory (Nyhus & Barceló, 2009). However, the frontal lobe continues to be used as a heuristic for the neuroanatomic structure of executive functions.

Furthermore, there is crucial to keep in mind that the frontal lobes have different areas with different functions. From a structural neuroanatomical point of view, the

frontal cortex can be divided into four main areas: (1) dorsolateral cortex, (2) orbitofrontal cortex, (3) ventromedial cortex, and (4) anterior cingulate cortex (Miller & Cummings, 2007; Stuss & Knight, 2013; Zilmer et al., 2008). These structures are located in the anterior part of the brain and are associated with the control and monitoring of complex behavior (Miller & Cummings, 2007; Stuss & Knight, 2013). In terms of frontal-cortical neuronal circuits (functional neuroanatomy), we can also distinguish four circuits or neuronal systems that tend to be associated with executive functioning: (1) dorsolateral prefrontal circuit (DLPC), (2) orbitofrontal circuit (OFC), (3) anterior cingulate circuit (ACC) and (4) ventromedial circuit (VMC) (Marron et al., 2014; Zilmer, Spiers, & Culbertson, 2008). For Stuss and Knight (2013), each circuit involves a set of cortical and subcortical networks and structures that work in an integrated and complementary way in mediating complex responses (see Figure 5).
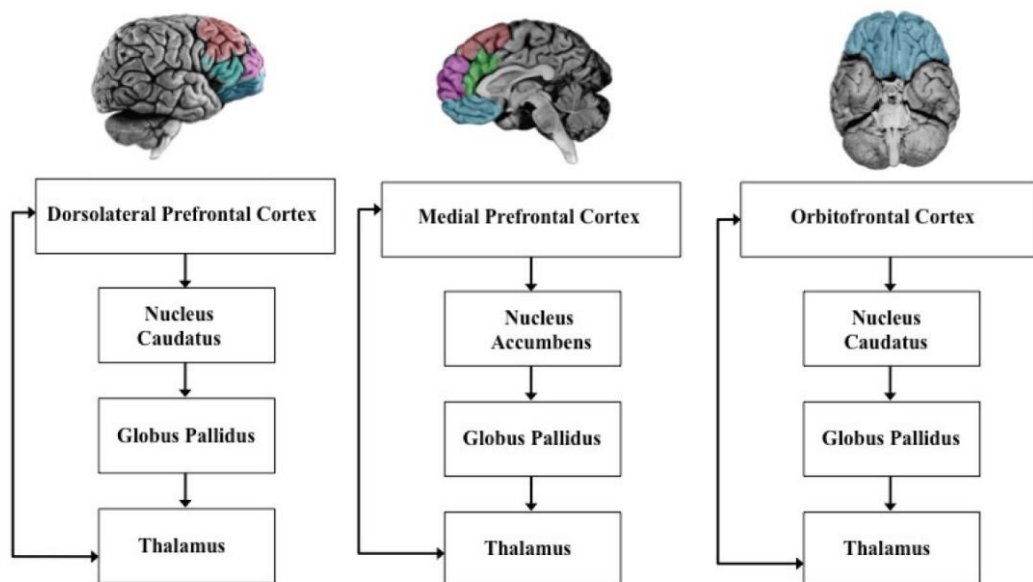

Figure 5. Representation of three cortico-subcortical circuits of executive functions from Stuss and Knight (2013).

DLPC tends to be related to executive functions, especially working memory, sequencing, and cognitive flexibility (Zilmer et al., 2008). The Wisconsin Card Sorting

Test (WCST) has been systematically associated with this neuronal network (Nyhus & Barceló, 2009; Stuss & Knight, 2013). OFC (medial and lateral) seems to be associated with emotional processing in decision making, cognitive and social judgments, and inhibition of overriding responses (Marron et al., 2014; 2008). ACC tends to be associated with functions such as response monitoring, error detection, conflict resolution, and affective/motivational behavior (Marron et al., 2014; Zilmer et al., 2008). Finally, the VMC is associated with functions involved in decision-making based on emotion, processes of affective regulation of social cues, long-term memory, and self-representations (Clarke et al., 2008; Roy, Shohamy, & Wager, 2012).

Frontal lobe dysfunction tends to be described as executive dysfunction (Wilson et al., 1998), which is a set of cognitive, emotional, and behavioral symptomatology that may be present in several psychopathological conditions, such as schizophrenia, bipolar disorder, depression, attention deficit disorder, and substance use disorders (Diamond, 2003; Faustino et al., 2019c). Research also suggests that there could be closed associations between executive symptomatology and specific deficits in neuronal networks. To prefrontal *orbital and medial frontal* circuits and regions are attributed symptoms of *social and emotional disinhibition* (e.g., grandiosity, sexual exhibitionism, restlessness, anger, and irritability) and *apathy* (e.g., depression, decreased attention, indifference, loss of initiative). To the prefrontal *dorsal and lateral frontal* regions are attributed symptoms of *loss of focus and planning* (e.g., distractibility, decreased anticipation, forgetfulness) and *loss of abstract attitude* (e.g., forgetfulness, stimulus bond, and perseveration). These symptoms are commonly observed by psychotherapists and represent important aspects of the psychotherapeutic process (Diamond, 2013, Cozolino, 2017). As described here, clear links between these symptoms and executive function deficits can be identified. If so, why is it that clinical psychologists and

psychotherapists do not develop specific theories, assessment, and interventions focused on this established knowledge? And why is there no executive functions assessment method for psychotherapists to use in their daily practice?

Finally, it is now clear that the executive functions may play a deeper role in psychotherapy and probably in the disorder theory. The present work will explore the relationships between the three-factor model (set-shifting/flexibility, updating, and inhibition), early maladaptive schemas, and the regulation of psychological needs.

iii. Memory and complex attention

The psychotherapy process is extremely dependent on memory and attentional processes (Cozolino, 2017; Lane & Nadel, 2020). Memory and complex attention are usually studied separately in the context of cognitive psychology and/or neuroscience and tend to be targeted for rehabilitation programs by clinical neuropsychologists when working with individuals with neurocognitive disabilities (Long et al., 2018; Lezak et al., 2014; Wilson et al., 1998). However, there is an increasing awareness of the importance of enhancing memory and attention to improve psychological treatments (Harvey & Gumport, 2015), and neither can function without the other (Chun & Turk-Browne, 2007). This assumption may be supported by different aspects that will be described below, but first, it is important to differentiate these two processes.

Memory may be described as a set of several neurocognitive processes responsible for the acquisition, encoding, storing, and retrieving of information that allows individuals to make sense of their worlds and to predict future outcomes (Baddeley, 2007). Typically, it is referred to as an information processing system with implicit and explicit functioning which can be divided into sensorial memory, short-term/working memory, and long-term memory (Baddeley, 2007). Memory as a multi-

component process may be divided into declarative and implicit memory, which can be subsequently divided into episodic (events, experiences), semantic memory (concepts, semantics), and procedural (habits, tasks) respectively (Baddeley, 2007). Moreover, several neuroanatomic structures are associated with memory, such as the hippocampus, striatum, amygdala, and mammillary bodies, along with specific learnings, such as the amygdala for fear conditioning and hippocampus for spatial learning (LeDoux, 2007, 2015; Kandel, et al., 2013). This was previous described as the amygdaloid-hippocampal memory network (AHMN).

Douglas and Pribram (1969) suggested that the amygdala and hippocampus play different roles in the attentional process. The amygdala seems to encode and be triggered by specific aspects of the environment (attention), whereas the hippocampus inhibits responses, attention, and stimulus input (habituation). Associated with this, Ledoux (1998) stated that the amygdala is involved in generalized responses to perceived stimuli (e.g., fear regarding all snakes), and the hippocampus is associated with specific learned responses (e.g., remembering that some snakes aren´t poisonous). Thus, several models have been purposed to explain how memory works and to understand what the implications of the memory process are, as one of the most fundamental neurocognitive functions allowing individuals to make sense of their world (Prebble et al., 2012). It is through episodic and autobiographic memory that individuals connect themselves with their past, make sense of their actions, feelings and behaviors and develop a sense of identity and a differentiated sense of self (Prebble et al., 2012). However, disruptions in a sense of self are documented in several psychological disorders, along with memory deficits. Memory difficulties are found in individuals with major depressive disorder (Perini et al., 2019; Suciu et al., 2017), anxiety disorders (Balderston et al., 2017;

Zlomuzica, et al., 2016), posttraumatic stress disorder (Samuelson, 2011), and schizophrenia (Nelson et al., 1998).

Attention, (sometimes referred to as complex attention) may be described as a neurocognitive function that allows individuals to focus mental resources on several stimuli and/or information, while inhibiting, disregarding, or filtering non-relevant information (Posner, 2012). Complex attention is one of the most important functions for cognitive and affective processing of relevant information and is virtually linked to the concept of executive functions and memory (Baddeley, 2007; Diamond, 2013; Posner, 2012). As described earlier, the salience network (SN), is composed of the prefrontal cortex, anterior cingulate cortex, and the insula, and it is responsible for choosing and maintain the focus of attention on the most relevant internal and external stimuli to guide emotional and interpersonal processing (Menon & Uddin, 2010; Wiech et al., 2010). Several models were elaborated to describe and explain how attentional processes work, however, one clinical model remains one of the most influential, which is the clinical model of complex attention by Sohlberg and Mateer (1989). The authors argued that the attentional process may be divided into 5 sub processes: (1) focused attention (ability to focus discretely on specific stimuli), (2) sustained attention/concentration (ability to maintain a consistent response), (3) selective attention (ability to maintain attention in the face of distractions or competing stimuli), (4) alternating attention (mental set-shifting between different tasks or conditions – may overlap with cognitive flexibility) and divided attention (to respond simultaneously to several tasks or environmental demands). The effectiveness of the application of this model in neurocognitive rehabilitation had been studied mainly in individuals with traumatic brain injury (De Luca et al., 2016; Hallock et al., 2016; Park & Ingles, 2001; Sohlberg et al., 2000) and attentional deficit and hyperactivity disorder (Peng, & Miller, 2016; Semrud-Clikeman & Ellison, 2009)

with satisfactory outcomes (Sohlberg & Mateer, 2006). Even though complex attention has been a focus for cognitive psychologists and clinical neuropsychologists for more than a half-century ago, it is extremely important in psychotherapy (Cozolino, 2017).

One major evidence of the connection between these two neurocognitive processes (complex attention and memory) is the overlap in the reported symptomatology across different psychological disorders, beyond neurological or neuropsychological syndromes (Marvel & Paradiso, 2004). On the one hand, attentional deficits tend to be reported in negative affect (Mor & Winquist, 2002), anxiety disorders (Shi et al., 2019), depression (Marvel & Paradiso, 2004), and attention deficit disorder (Hinshaw, 2018). On the other hand, memory deficits were also reported in major depression (Behnken et al., 2010; Taconnat et al., 2010), bipolar disorder (Martino et al, 2011), schizophrenia (Forbes et al., 2009), post-traumatic stress disorder (Jelinek et al., 2006), and other anxiety disorders (Airaksinen et al., 2005).

b. Neurobiological contingencies of interpersonal interactions regarding affective phenomena

Neurobiology can be viewed as the neuronal substrate of psychological phenomena and it manifests as concrete matter in the physical realm (Cozolino, 2017). From mitochondrial cells, endocrine reactions, neurons, neural networks, neuroanatomical structures, and neurocognitive functioning, neurobiology plays a central role in shaping how humans experience affective phenomena and how they develop interpersonal relationships (Cacioppo & Cacioppo, 2010; Cozolino, 2017). It is a synergy between these neurobiological structures combined with several psycjological and neurocognitive processes that constitutes the neural substrate of the human mind and experience. In this sense, the present subchapter will introduce the following topics: (i)

epigenetics, neuronal plasticity, neurogenesis, and mirror neurons, (ii) underlying neurobiology of schemas and emotional states, (iii) default mode network and the self, and (iv) nonconscious emotion processing.

i. Epigenetics, neuronal plasticity, neurogenesis, and mirror neurons

Several neurobiological mechanisms are key processes to understand how human beings develop, elaborate, and shape interpersonal interactions and experience affective states (Siegel, 2012). These processes start early in human development and work as neural mechanisms that shape and re-shape neuronal structures that are core aspects of cognitive, emotional, and social processing. *Epigenetics, neuronal plasticity, neurogenesis, and mirror neurons* will provide a brief description of how these mechanisms play a distinct role in how humans process social information and how that information is stored and used for affective processing.

Epigenetics is the branch of biology that studies the interaction between genes and their products and phenotype manifestation (Kandel et al., 2018; Waddington, 1968). This term describes the modification of undifferentiated cells into specific cells (Plomin et al., 2017). As described in the previous chapter, the understanding of these mechanisms helps scientists and clinicians to reveal gene-environment interactions that account for the variations in the expression of specific phenotypes (Knopik, et al., 2017; Plomin et al., 2017). Genetic expression is, to some extent, controlled by environmental demands, which produce differences in several human traits and emotional states with clinical relevance (Knopik, et al., 2017; Plomin et al., 2017). Within the classical "nature" and "nurture", i.e. biological vs. nonbiological vulnerability-stress-model of mental disorders, there has been a conceptual dichotomy of biological risk factors and pharmacological

treatments on one hand, and psychological mechanisms as well as psychotherapeutic interventions on the other hand. Recent neurobiological research, however, provides evidence for convergence and integration of biological and psychological mechanisms on an epigenetic level (Schiele et al., 2020). Thus, what psychotherapy attempts to achieve is to reduce emotional suffering, increase flexibility and psychological well-being, and promote self-development, which implies the activation of new genetic phenotypes based on experience. In this sense, psychotherapy is a type of healing relationship that produces neuronal modulation through epigenetic activation due to cognitive, emotional, and social experiences (Lane & Nadel, 2020).

Psychotherapy survived several decades without a brain-based model of change, which was partly a consequence of the old view of the brain as a static biological organ. However, recent research showed that the brain is not a static organ and has several layers of plasticity, which support new life learnings related to environmental challenges (Betjemann et al., 2010; Hulshoff Pol et al., 2006; Schmitt et al., 2007). The brain is now viewed as an organ that tends toward neuronal stabilization during development and aging while retaining the ability for new learning and adaptations, which means humans retain the ability of neuronal plasticity to some extent throughout the entire life (Rosenzweig & Barnes 2003).

Neurogenesis is the process of generating new neurons (Kandel et al., 2015), which was thought only to occur during the early development of the neuronal structures in utero or early stages of development (Shore, 2003). However, recent findings showed that neurogenesis also occurs in human adults in two brain areas, the dentate gyrus of the hippocampus and the subventricular zone of the lateral ventricles (Erickson et al., 2011). The hippocampus, as said before, is responsible for declarative memory formation, which allows the development of new memories and probably new habits and skills based on

contextual behavior rehearsal (Kandel et al., 2015). The subventricular zone is best known by the neuronal differentiation regarding odor processing in other mammals and is associated with Huntington's disease (Ernst, et al., 2014). Despite some controversies regarding the development of new neurons in adults (Sorrells et al., 2018), adult neurogenesis seems to be implicated in life adaptation beyond memory and learning, such as adaptations to stress, depression, anxiety, neurocognitive skill building, and/or injury recuperation (Cameron & Glover, 2015).

Human brains have differentiated complex neuronal networks specialized in tracking and elaborating other behaviors and intentions (Cozolino, 2017). Since birth babies rely on their mother's expressions and actions to start developing a coherent theory about how others will react and behave towards the self (Shore, 2003). This focus starts on the facial expressions of caretakers which is one of the most important bases for the development of the theory of mind. From a neurobiological perspective, mirror neurons are the class of neurons that allows humans to mimic others' behaviors and to link observations and actions to predicted outcomes related to internal affective states (Shore, 2003). Mirror neurons allow humans to (1) learn from observed behaviors, (2) predict and anticipate outcomes, (3) engage in social interactions based on emotional attunement and empathy (Cozolino, 2017). These neurons are distributed through several brain areas, such as premotor cortex, primary somatosensory cortex, and inferior parietal cortex (Kandel et al., 2015), which shows the complexity of neuronal networks that are involved in how humans process social information.

Therefore, mirror neurons along with epigenetics, neurogenesis, and neuronal plasticity are core neurobiological mechanisms that shape how humans learn to express themselves in contexts. Thus, these mechanisms are also a key process of emotional learning regarding associations between others' expressions and internal experiences,

which are essential for the emotional processing of social stimuli. Moreover, these neurobiological mechanisms interact with the formation of early schemas, which are the cognitive-affective structures in memory that help individuals interpret their realities. Through the distribution of the mirror neurons on other neuronal networks it is plausible to assume that they would play a role in empathy and emotional attunement in psychotherapy.

ii. The underlying neurobiology of schemas and emotional states

Schematic functioning and states of mind are, in part, determined by the number of mental elements that activate and cluster together in the flow of consciousness (Faustino et al., 2020; Siegel, 2012). Schemas and affective states reflect implicit learnings regarding the frustration and/or satisfaction of the psychological needs, which may be viewed as the cornerstone of the present integrative disorder theory (Faustino & Vasco, 2020a,b,c,d). Due to the universality of the concept of schemas and affective states, it is safe to assume that these higher-order psychological constructs have core neurobiological structures that support their neural underpinnings. Thus, recent research supports this assumption.

Schemas act as templates and are described as structures in memory that encode and facilitate the retrieval of information that is salient/congruent with what is stored. Gilboa and Marlatte (2017) described several studies based on associative learning tasks, wherein activated schemas may enhance and/or distort the mnemonic process, impact memory transformation, and promote cortical integration. The enhancement or the distortion processes were dependent on the congruency of the stimuli with the stored schematic information. If the stimuli were congruent with schema information, the associations of memory were enhanced, but if the stimuli were incongruent, the

associations of memory were distorted. Thus, these processes were observed through functional magnetic resonance (fMRI), showing close interactions between the hippocampus, angular gyrus (AG), ventromedial prefrontal cortex (vmPFC), and unimodal associative cortices (Gilboa & Marlatte, 2017). Moreover, the inferior occipitotemporal cortex tends to be implicated in schemas regarding face recognition in memory (Corrow et al., 2016), which means that there are other major neuronal structures implicated in the schematic functioning. Also, this raises some questions regarding schema definitions when it comes to associated represented elements, such as emotions or sensations. Thus, when it comes to emotional states maybe a clear neurobiological definition would take a clear heuristic value.

Neurons create spontaneous firing activity that tends to cluster together to form a subjective experience that may be time and or context dependent (Sussman & Steinschneider 2006). LeDoux (2012) has proposed that the *emotional brain* developed through evolutionary pressures that fostered several neurobiological mechanisms that correspond to different survival adaptations – escaping from danger, finding food, mate selection, and social bonding. Thus, as described in chapter two, these survival adaptations may be closely related to the regulation of psychological needs. Ledoux (2012) emphasized that during a maladaptive learning situation traumatic conscious experiences are encoded in the hippocampus and related areas, while the fear-conditioned components are stored in the amygdala-based system. Thus, individuals may access information in memory through two parallel pathways, the conscious (frontal lobe) and the automatic system (amygdala-system). This is called the dual systems theory, which will be described in the next chapter. Moreover, Siegel (2012) stated that traumatic experiences disrupt this process. Further, dysfunctional early experiences are encoded in neural systems between the amygdala and the brain stem, which are then strengthened by

repletion and biases. Thus, Ledoux (2012) described that trauma learning is not unified in the brain. From a neurobiological and neuroanatomical perspective, the brain may divide the experience of trauma into several different areas. The cognitive content of trauma, such as images, thoughts, and representation may be stored in the pre-frontal cortex and hippocampus, while the emotional memory is encoded in the amygdala. This means that emotional and bodily responses may occur without the cognitive processing system, typically associated with awareness, which gives rise to a subjective affective state of mind (Siegel, 2012). In the next chapter, I will take a deeper look at the neurobiology of the amygdala.

iii.   Default mode network and the self

The sense of identity, familiarity, coherence, and autobiographical consistency is a fundamental aspect of human experience and a key domain in human personality. The consistent experience of emotions, thoughts, needs, and behaviors encodes and shapes memory-based mental structures responsible for meaning-making which yields the predictability and space-time continuity of the autobiographic selves (Greenberg & Goldman, 2017; Pascoal-Leone et al., 2004). As stated before, at the core of mental health lie the long-lasting learnings regarding the satisfaction and/or frustration of the emotional core needs which is closely connected with the sense of self (Faustino & Vasco, 2020b,c; Young et al., 2003). From a neurobiological perspective, some authors speculated on whether there is a neural substrate that would account for this cluster of experiential elements. Several investigations seem to support this assumption.

Hans Berger, in 1929, documented that the brain remained active when subjects were not performing any task, and this was ignored for about 70 years (Cozolino, 2017). The brain showed some activation when participants were in a resting condition, which

suggested that when individuals were not engaging in any task, some brain structures were active (Cozolino, 2017; Tyron, 2014). This was somewhat puzzling. Recently, researchers noted that a consistent set of brain regions remains active when individuals are not performing attention tasks, but are activated when individuals are performing self-related tasks (Cozolino, 2017; Raichle & Snyder 2007; Shulman et al., 1997). The neuronal areas that turned on and off consistently according to task engaging included the medial prefrontal cortex, the midline regions of the posterior cingulate cortex, and the precuneus region of the parietal cortex (Andrews-Hanna et al., 2014; Broyd et al., 2009). This coherent and consistent functional neuronal network was defined as the Default Mode Network (DMN), and subsequent research established this network as the resting state network of the brain (Brucker & DiNicola, 2019; Mak et al., 2017; Raichle & Znider, 2007; Tyron, 2014).

Typically, six neuroanatomical regions are associated with the DMN: the medial prefrontal cortex, medial temporal lobe, hippocampus, posterior cingulate cortex, and precuneus region (Brucker & DiNicola, 2019; Cozolino, 2017). Each specific region is attributed to a differentiated mental process that contributed with key features for the notion of the self. The medial prefrontal cortex is attributed to the process of self-relevant reflection and the theory of the mind. The medial temporal lobe and hippocampus are attributed to the process of autobiographic memory and associations with experience/schematic learnings, respectively. The posterior cingulate cortex is attributed to the process of sensory integration. The parietal cortex is attributed to the process of self-awareness, social comparisons, and visual-spatial organization, and the precuneus region is attributed to the process of memory attribution and internal mentalization (Broyd et al., 2009; Cozolino, 2017). Furthermore, these functions appear to be directly associated with what is expected to be the neural substrate for the subjective experience

of the self, because the DMN encompasses the structures associated with several mental components described as determinants for the construct of self. Nevertheless, recent human and animal studies suggest that DMN is not a single functional network but multiple interwoven networks that shares similar anatomical and morphological organizations and which may support a differentiated type of internal and/or external representational processing (Brucker & DiNicola, 2019). This would imply a greater differentiation of the DMN functions beyond the experience of self, which is consistent with the notion of autocorrelational functionality of the frontal lobe functioning regarding internal and external goal-oriented tasks (Cozolino, 2017).

The relationship between the executive functions and the DMN may also be a core aspect of the integration of emotion and cognition, through the Fronto-Parietal Executive Network (FPEN) (Cozolino, 2017). Dorsal and ventral areas of the prefrontal and orbitofrontal cortex decrease their activation during goal-directed tasks, but become active during self-relevant tasks, reflections on the experience of emotions, and the attribution of mental states of others (Cozolino, 2017; Frith & Frith, 1999; Tyron, 2014). Thus, the medial and prefrontal cortex areas are shared by the DMN and the FPEN, which implies an overlap of activation between these two structures and raises questions regarding the elaboration of the mental structures of the self-self and self-others (Cozolino, 2017; Faustino et al., 2019a). Maybe the experience of the self is intrinsically related to the experience of the self and others, which is consistent with the notion of self-other schemas described previously. Thus, medial, and prefrontal cortex areas are established as core structures for social cognition and emotional experience of the self and they show different metabolic activity during external and internal demands (Beer et a., 2007; Brucker & DiNicola, 2019; Cozolino, 2017; Frith & Frith, 1999; Raichle & Znider, 2007). This parallel pattern of activation/deactivation may be what individuals

describe as the loss of attention to others when they are introspectively engaging in self-reflection and focused on their own emotional experience (Cozolino, 2017; LeDoux, 2015).

Theoretical implications are clear. The DMN regions appear to support a consistent and coherent synergy of sensory elements of the body and internal experience which are core features for the experience of emotions that support a sense of self, which is dependent on the regulation of psychological needs, which express past learnings (Faustino & Vasco, 2020a,b,c; Young et al., 2003). The experience of the self may encompass three domains: (1) self-awareness, (2) social awareness, and (3) differentiated cognition and perception. Self-awareness implies that individuals can be conscious at some level of thoughts, needs, emotions, and behavior and that can differentiate and reflect on them. Also, they must have a subjective sense of belonging which helps them to remember past experiences and events (autobiographical memory). These functions are supported by the medial prefrontal cortex, medial temporal lobe, hippocampus, and posterior cingulate cortex. Social awareness implies the ability to differentiate the self from others and to attribute mental states to others (theory of mind). These functions are functions that are supported by the parietal cortex, medial orbitofrontal regions, and precuneus. Finally, to have a differentiated cognition and perception it is important to have a differentiated self and self-other which is consistent with activation/deactivation of several branches of the DMN regarding external or self-relevant tasks (Cozolino, 2017; Grawe, 2007; LeDoux, 2015). All these complex psychological functions are core aspects of self because they all contribute to an experienced sense of continuity over time, related to autobiographic events, social expectations, and personal choices (Damasio, 1994). Therefore, the DMN may serve as the psychological baseline for the self which allows humans to reflect on past relational experiences and mentalize the self-sense meanings

(adaptive or maladaptive), which also allows the focus on internal affective experience, reflection and elaboration of cognitive-affective schemas that shape self and worldview.

Moreover, disruptions of the DMN functioning have been found in individuals with several psychopathological conditions, such as depression and anxiety disorders, posttraumatic stress disorders, dementia, and schizophrenia (Cozolino 2017). These disorders include disturbances in autobiographic memory, reality testing, interpretations of the intentions of others, and a fragmentation of the sustained sense of a coherent self (Guo et al., 2014; Van Buuren et al., 2012), which may support the hypothesis that the DMN is the neuronal basis for the self. Thus, in depressed individuals, DMN impairment was correlated with negative self-biases, hopelessness, and dysphoric emotions (Grimm et al., 2009; Guo et al., 2014). Maybe failure in DMN inhibition while performing external tasks leads to excessive personalization of their experiences (Li et al., 2014), fostering lower self-esteem and depressive symptoms (Cozolino, 2017). Hyperarousal and hypervigilance are a hallmark of anxiety disorders which represent deficits in fear inhibition related to real or imagined threats, which may impair the DMN (Cozolino, 2017). Thus, individuals with obsessive-compulsive disorder show less DMN inhibition while performing focused tasks, which may illustrate their difficulty in stopping thought and behavior triggered by anxiety states (Stern et al., 2012). Individuals with posttraumatic stress disorder showed increased connectivity between the amygdala and the insular lobe which, may impar inhibition of the DMN (Rabinak et al., 2011), leading to deficits in self-referential processing and episodic memory intrusions (Cozolino, 2017). Finally, Pomarol-Clotet and collaborators (2008) found that individuals with schizophrenia showed difficulties in the activation of the DMN during memory tasks, which may reflect difficulties in the differentiation between external attention and memory, which may lead to consciousness contamination.

From an integrative perspective of psychology and neuroscience, the theoretical understanding of the hypothesized neuronal network structure of the self is a key aspect not only for increasing the understanding of human experience but also for raising the level of abstraction regarding the meta-level conceptualization of this work.

c. Non-conscious affective processing

It is widely assumed that the human mind comprises a wide array of implicit and explicit phenomena that tend to cluster coherently together in the flow of consciousness (Dehaene et al., 2006; Roser & Gazzaniga, 2004; Siegel, 2012). These processes may unfold consciously or subliminally, elicited by sensory input that achieves perceptual or pre-perceptual processing with adaptive evolutionary purposes (Epstein, 1994; Grawe, 2007; Rossouw, 2014, Tyron, 2014). As stated before, maximization of pleasure and fear/threat avoidance are two major driving principles that shaped the human mind through evolution, and which are closely associated with emotional processing and the emotional core needs (Epstein, 1994; Grawe, 2007; Rossouw, 2014; Young, et al., 2003). In this sense, affective processing has an intrinsic evolutionary value based not only on the signaling of the degree of the regulation of psychological needs (Vasco et al., 2018) but also in threat processing related to fear avoiding (Grawe, 2007; Rossouw, 2014).

Wiens (2006) emphasized that when it comes to threat processing, automatic and implicit judgments are mental processes that tend to be more effective, regardless of cognitive control. This type of subliminal processing needs to be carried out unconsciously so as to produce a quick response to adapt to environmental demands (e.g., fight, flight, or freeze). Several experimental paradigms were used to explore this type of subliminal processing, wherein humans perceive emotional stimuli without conscious awareness. These paradigms used attention manipulation, binocular rivalry, and visual

masking. In the manipulation of attention paradigm, participants are instructed to attend to certain visual stimuli to the detriment of others, which will be perceived only unconsciously, due to being outside the subject's visual attentional focus. In the binocular rivalry paradigm, participants are instructed to wear glasses while two stimuli in different colors are presented, but those glasses only have a lens of one of these colors, and the other lens is of the other color. This implies that individuals only have the perception of one of the two stimuli, while the other is being perceived only unconsciously. Finally, the visual masking paradigm, which is the paradigm used in the present study, consists of the presentation of a target stimulus for a shorter duration than the threshold of consciousness, immediately followed by the presentation of an irrelevant subliminal stimulus (e.g., a mask stimulus), which covers the presentation of the target stimulus.

Evidence of non-conscious affective reactions may be found in several studies regarding the manipulation of attention of subliminal processing of affective visual stimuli (Wiens, 2006). Several fMRI studies described greater activation of the amygdala in the presentation of stimuli of faces that express fear than in the presentation of non-affective stimuli or stimuli of emotionally neutral faces or faces expressing joy (Critchley et al., 2002; Etkin et al., 2004; Killgore & Yurgelun-Todd, 2004; Liddell et al., 2005; Rauch et al., 2000; Sheline et al., 2001). Moreover, Tamietto and Gelder (2010) differentiated two neuroarchitecture systems for subliminal processing of affective stimuli. One was based on the visual processing of stimuli and included the superior colliculus, amygdala, the nucleus accumbens, a visual pulvinar and an innominate substance. The other included a subcortical neuronal system associated with emotional reactions, the consolidation of emotional memories, and motivational and dispositional tendencies, including the locus coeruleus, basal ganglia, the hypothalamus, hippocampus, and periaqueductal gray substance. Furthermore, recent exploratory studies based on a

paradigm that combines personality domains with the manipulation of attention of subliminal processing of affective visual stimuli showed theoretical coherent associations between traits and emotional processing.

i. Complex emotional systems and dimensionality of emotions

The universality of human emotions is now a scientific fact (Ekman et al., 1969; Ekman & Friesen, 1971), which posits that emotions and emotional experiences are a core factor in understanding complex processes of the integration between neurobiology and social learnings. It is widely assumed that emotional experience is shaped internally and externally (how we express emotions), through contextual factors and socialization processes that interact in a way that modulates all developmental stages of socio-emotional learning (LeDoux, 2012). In this sense, the modulation of the emotional experience may be viewed as a developmental task belonging to a very important domain of human personality (Goldman & Greenberg, 2017; Panksepp, 2005; 2011). Several authors developed different theoretical models that tried to explain these complex interactions between affective regulation and the development of human personality.

Lewis (2000) developed the theory of dynamic systems which describes how several cognitive, emotional, and temperamental dimensions combine to develop a human personality. Self-organizing systems are sets of interdependent processes at different scales (e.g., macroscopic and microscopic level), combined with complex hierarchical patterns (Lewis, 2000). These interactions function in feedback loops as the lower-level scale phenomenon (e.g., microorganic process) contribute to the higher scale process (e.g., psychological process). Self-organizing systems are time-dependent and context-dependent, which means that they depend on the interactions between neuronal systems and environmental stimulation (Cozolino, 2017; Lewis, 2000). For instance, a neuronal

network needs to be developed to encode perceptions and cognitions regarding the experience of fear of the dark in children. However, when this normative fear is overcome through developmental stage progression, a new complex neuronal network needs to be developed to encode new information, taking into account previous learnings. Thus, Lewis states that these systems become progressively more complex over time. Therefore, it is possible to describe three types of phenomena: Simple episodes of emotion (lasting seconds or minutes), the mood states (which last for hours or days), and personality patterns (which persists for years). Lewis (2000) states that these emotional phenomena can be accommodated, according to time parameters, in continuous scales of Microdevelopment, Mesodevelopment, and Macrodevelopment, respectively.

Microdevelopment implies dialectical and continued activations between emotion and cognition from an early age, whereby individuals tend to continue to make sense of emotions in a temporal progression. These appraisals are described as *emotional interpretations* that start to shape how individuals see the world and make sense of their experiences (Lewis, 2000). In other words, *emotional interpretations* may be viewed as the founding blocks of cognitive and affective schemas, which are responsible for the interpretations of environmental stimuli, supported by feedback loops between cortico-limbic structures at a microscopic level. Mesodevelopment represents at an intermediate level of abstraction the development of a stable and coherent affective state designed as humor. The development of humor is dependent on the previous products of early schemas and learnings organized through the assimilation and accommodation process (Lewis, 2000). The stability of the humor as a background affective state of the organism implies a continuous interaction between structural cognitive and affective structures (e.g., cortico-limbic structures), which crystallize throughout time and are the building blocks of personality. Rapid changes between humor tend to depend on cognitive

reappraisals, judgments, relational interactions, and *emotional interpretations,* representing a complex interaction between cognitive and affective schemas (Greenberg, 2015; Cozolino, 2017). Finally, macrodevelopment may be viewed as the long-lasting stabilization of the complex sets of interactions between cognition and emotion. It is the final stage of the self-organization of complex structures, which results from the temporal combinations of the *emotional interpretations* and their schematic functioning along with the stabilization of the cortico-limbic neuronal networks that are responsible for humor (Lewis, 2000). This is the final stage of the higher-order organization of complex beliefs systems with emotional valence, which encompasses several views of the self, the world, and the future (Beck et al., 2004).

Furthermore, despite the universality of emotions in humans, the process of socialization and culture shape how humans identify, describe, and express emotional experiences (Panksepp, 2010; LeDoux, 2012). Emotional experience is, in part, based on the specific combination of life learnings and experiences that each individual goes through (Greenberg, 2015). In this sense, emotional experience always has a subjective experiential tone, which means that the emotional experience may be viewed as a spectrum (Russell & Fehr, 1994; Rubin & Talerico, 2009). Russel's Circumplex Model (1980) conceptualizes affective states as arising from two different neuropsychological systems which underlie emotional valence and activation. According to the author, each affective experience is the result of a linear combination of the two independent systems, which are then interpreted as representing a certain emotion. The valence axis defines the polarity of emotions, representing the most negative emotions on the left and the more positive on the opposite side of the spectrum, on the right. The axis of activation at the top represents more intense emotions and on the opposite side, at the bottom, as emotions that it is considered of lesser intensity.

ii. An integrative model of bottom-up and top-down processes

Bottom-up and top-down models are classic descriptive representations of different modes of mental processing in psychology and neuroscience. The notion that cognitive and affective regulation of mental activity may follow ascending and descending pathways becomes a new exciting idea when applied to clinical psychology and psychotherapy (Cozolino, 2017, Grawe, 2007; LeDoux, 2013). This idea becomes even more appealing for integrative psychotherapists when researchers develop coherent integrative models that consider both processes. Ochsner & Gross (2007) developed a new model, which integrates bottom-up processing with top-down processes associated with emotions. These authors emphasize that the distinction between bottom-up and top-down processing is not absolute. It is a relative distinction, with heuristic value in conceptualizing the interaction of mental processes in the production and regulation of emotions. The authors admit that there may be a continuum in the mental processes associated with human emotions; at the poles of this qualitative scale, the two types of processing.

According to the authors, the top-down process may generate emotions and may also modulate them, due to the allocation of cognitive/attentional resources to a specific stimulus, activated by bottom-up processes. If a stimulus triggers bottom-up processing (e.g., episodic memory, external perception), top-down processes may modulate the emotional expression by reappraising that stimulus (Ochsner & Gross, 2007). Thus, the authors also state that top-down beliefs may have an important role on how the stimulus is evaluated, due to complex schemata regarding previous emotional experience, which is aligned with the notion of emotional schemas (Lehay, 2012). This may also imply that cognitive factors may lead individuals to interpret a neutral stimulus with a specific valence due to previous learnings. Moreover, Ochsner and Gross's (2007) model has five

main principles: (1) emotional responses are produced through interactions between various types of processes (bottom-up and top-down); (2) emotional responses are characterized by their valence, intensity, and potential to initiate changes in multiple response systems; (3) emotional configuration occurs when control processes, oriented towards a personal goal, shape the initial emotional response of neuronal systems from the bottom up; (4) it is necessary to take into consideration the type of response (experiential, physiological or behavioral) that is being altered when conceptualizing control process of emotion; (5) regulatory strategies differ in the extent/degree of activation based on different regions of the prefrontal cortex (PFC) and the anterior cingulate cortex (acc).

iii. Electroencephalography and ERP

As stated before, several neuroscience-based research paradigms are used to study subliminal emotional reactions. In the present study, the paradigm that was selected was the manipulation of attention of subliminal processing of affective visual stimuli, using event-related potentials (ERPs), measured by electroencephalography. The increase in the study of emotional information processing based on the presentation of images is due to the development of computers, new standardization of stimuli, and the use of neuroscience-based methodology (Etkin et al., 2005; Grawe, 2007; Kandel, 1998; Olofsson et al., 2008; Poucinho et al., 2004; Sousa et al., 2005). Electroencephalography is an electrophysiological technique that records the electrical activity emitted by the brain, using electrodes applied to the scalp of human or animal individuals (Kandel et al., 2013). This technique allows the recording of brain activity with high temporal resolution, in the order of milliseconds, setting the stage for the the study of the modifications of stimulus-dependent brain waves (Kandel et al., 2013). Different brain waves that make

up the electroencephalogram (EEG) can be analyzed for parameters of amplitude (of the order of microvolts), latency (of the order of milliseconds), frequency, positivity/negativity, and topographic distribution in the scalp (Olofsson et al., 2008). In this sense, several indicators may be used to explore changes in neuronal activity related to cognitive and affective processing.

An ERP consists of voltage fluctuations in the EEG by time in an event, such as the start of a stimulus or the execution of expressive motor activity. In this sense, an ERP waveform appears as a series of positive and negative peaks, which vary in amplitude and duration (Luck & Kappenman, 2012). The voltage changes recorded in the scalp that give rise to the ERP waveform reflect the summation of postsynaptic potentials (PSPs) that occur simultaneously in a vast set of neurons (Luck & Kappenman, 2012). Fundamentally, when studying mental phenomena, it is important to keep in mind that the ERP waveform, at a given moment, does not represent only the synaptic activity created at that moment, because PSPs can last between tens to hundreds of milliseconds (Luck & Kappenman, 2012). This implies that the measurement and distinction between discrete mental processes comport some level of concomitant error. Furthermore, according to Soares et al., (2015), effective visual stimuli applied in ERP studies had two categories: valence and arousal. Based on the International Affective Picture System (IAPS) (Lang et al., 2008), several studies allowed the discrimination of these two categories. The response to emotional stimuli may be conceptualized as *avoidance* and *approach*, which represent two different motivational systems; one focused on the defensiveness of the organism and the other focused on the well-being and survival of the organism. It is the valence that triggers the motivational system, and the arousal indicates the intensity of the activation (Soares et al., 2015). Valence effects are given by the comparisons between ERPs elicited by different images with the same level of arousal

and different level of valence, and these effects may have time precedence (Olofsson et al., 2008).

The valence dimension reflects the allocation of the initial selective attention to salient stimuli which can be detected in a time window of 100 - 250 milliseconds (Olofsson & Polich, 2007). Negative stimuli tend to evoke emotional responses with higher intensity levels than positive stimuli, which can be defined as a *negativity bias* (Norris, 2019). Olofsson and colleagues (2008) state that this may be due to survival mechanisms wherein negative stimuli take a direct route to the amygdala, triggering defensive attentional resources that facilitate encoding and storing of the negative affective event in episodic memory. Thus, in the time window of 100 – 250 ms (short latency), the ERPs are sensitive to perceptual features of the stimuli (e.g., colors), and specifically, P1 is sensitive to valence, showing higher values in occipital regions for negative valence stimuli relative to positive stimuli (negativity bias) with the same level of excitation, or neutral stimuli (Olofsson et al., 2008). In the 200 - 300 ms time window (middle latency), the secondary process of stimuli discrimination and response selection is detected (Olofsson et al., 2008). An ''early posterior negativity'' (EPN) has been documented, which consists of a negative amplitude for both positive and negative stimuli (Olofsson et al., 2008). One possible explanation is that the EPN may be an index of selective attention to affective activating stimuli, for their further processing; thus, these effects on EPN were obtained in different types of tasks (such as passive visualization or target detection), intervals between stimuli (from 0 ms to 6 s) and duration of the stimulus (120 - 1500 ms). Valence, however, influences the N2 component. With controlled awakening, negative stimuli generate a more negative amplitude in this component than positive stimuli. The N2 and P2 are sensitive to the effects of arousing positive stimuli, which may imply that the modulation of the amplitude of the ERP components of this

time window is dependent on the selective attention to the key elements that compose the affective visual stimulus (Olofsson et al., 2008). This interpretation supports experimental studies with non-affective stimuli, where ERP modulations were associated with perceptual categories and characteristics, which could be attributed to selective attention mechanisms (Olofsson et al., 2008). Finally, in the >300 ms time window (long latency), the affective segment is dominated by the P300, which is composed of the P3a and P3b subcomponents associated with attentional and initial memory events (Polich, 2007). The P300 may also be described as late positive potential, due to the latter portion of the ERP waveform which shows elevated positivity for arousing stimuli (Olofsson et al., 2008). Thus, if the valence level can modulate the P300 when arousal level is controlled, this can be interpreted as an approach/withdrawal response (Olofsson et al., 2008).

Concluding Thoughts

Neuroscience is the study of the central and peripheral nervous system. From a scientific perspective the brain is the organ of the mind, which is why neuroscience has lots to offer to the understanding of several psychotherapeutic mechanisms. As stated before, early experiences shape neuronal networks that are responsible for the development of several mental and neurocognitive processes which are the basis for human cognitive, affective, behavioral, interpersonal, and somatic/physiological processing. Neurocognitive processes, such as executive functions, attention and memory are strongly related with daily life functioning. Individuals with impairment in these functions manifest a wide range of neurocognitive difficulties (e.g., impulsivity, cognitive inflexibility, poor problem solving), and psychopathological symptomatology (e.g., anxiety, depression, lack of sense of self), which can be linked to complex neural network malfunctioning (Faustino, 2021; Manon, 2011). Thus, the articulation between

neurocognitive processes and complex neural network systems can be described as the neurocognitive psychopathological syndrome. In this sense, neurocognitive impairments may also be linked to affective processing. This will be addressed in further studies.

As stated before, non-conscious emotional processing is thought to be linked with latent mental structures that are responsible for attribution of meaning to the events in an implicit and automatic manner. Meaning structures and emotional phenomena can be accommodated based on the notions of microdevelopment, mesodevelopment, and macrodevelopment, advanced by Lewis (2006). Results from previous works support this assumption (Baião, 2018; Bernardes, 2017). Therefore, based on previous works, it is theorized that maladaptive schemas may be described as those mental structures that are developed based on early toxic experiences, maintained through defense maneuvers (e.g., defenses, coping and distortions), and are responsible for implicit and automatic cognitive, affective, behavioral, interpersonal, and somatic/physiological processing. Thus, it is theorized that these structures may manifest different motivational tendencies of approach and avoidance towards emotional stimuli, and this will be explored with an experimental task.

5. *Clinical Decision-Making: A science-based approach to the process of change*

In the previous chapter, an integrative view of neurobiology and psychotherapy was described emphasizing the value of neurocognitive functions and neuronal integration, neurobiological contingencies of affective and interpersonal interactions, and non-conscious affective processing, which may be regarded as foundational elements in a neuroscience-based psychotherapy model.

This chapter is focused on the exploration of evidence-based clinical decision making. Therapists are explicitly or implicitly guided by internal maps that lead them to make decisions in clinical settings (Norcross, 2011; Norcross & Wampold, 2019). These internal maps tend to be rooted in their theoretical approaches which represent their worldview when it comes to making decisions about which principle and/or technique should be used to match patient needs (Beutler et al., 2002). These internal maps also guide therapists as to when they should apply their therapeutic intervention. Several theoretical approaches have explicitly elaborated clinical guides regarding specific interventions based on moment-to-moment intervention (Ellitot et al., 2004; Goldman & Greenberg, 2017; Saffran & Murran, 2000), which may be regarded as a *state-based* intervention. Other approaches focused their attention on the identification of phase-by-phase intervention (Vasco et al., 2018; Prochaska & DiClemente, 1980), which may be regarded as a *trait-based* intervention. Vasco and colleagues (2018) stated that both *state* and *trait* variables are taken into consideration when it comes to clinical decision-making. Based on the specific needs, styles of communication, and patient features, therapist promote therapeutic tasks with a moment-to-moment and stage-dependent responsiveness.

Finally, some theoretical approaches focused their attention on several processes of change regarding specific dysfunctional variables (Young, et al., 2003; Hayes et al., 2013), which may be viewed as a *construct-based* intervention. In this sense, to better understand how these models may be integrated, the present chapter will be divided into four major subchapters: (1) scientific evidence for psychotherapeutic relationships and responsiveness that promote behavior change, (2) process models and trait vs state responsiveness, and (3) identification of phase stages of strategic change principles.

In the first subchapter, called "*scientific evidence for psychotherapeutic relationships and responsiveness that promote behavior change",* recent scientific findings will be described. New data showed that clinical decision making based on levels of severity, coping styles, reactance level, and motivational stage are positively associating with psychotherapy outcome (Norcross & Wampold, 2018). The second subchapter, named "*process models and trait vs state vs construct responsiveness*", will be focused on how these three may be coherently integrated into a comprehensive framework to make decisions based on different patient variables, especially regarding complex states of mind which encompass dysfunctional themes and defensive maneuvers within the same experiential cycle. The third subchapter, named "*Identification of phase stages of change*", will be focused on a time sequence of strategic objectives based on several stages of change (Vasco et al., 2018).

a. Scientific evidence for psychotherapeutic relationships and responsiveness that promote behavior change

The quest for evidence-based variables that promote behavior change is ongoing. Since the first APA task force, new evidence was found regarding therapist and patients variables that account for differential weights in psychotherapy outcome (Norcross &

Wampold, 2019). In this sense, this subchapter is focused on an update of findings regarding differential variable weighs in explaining psychotherapy outcome, therapist behaviors that work, and patient variables that have a significant value to the referred equation.

According to Norcross and Wampold (2019), the variance of psychotherapy outcome can be attributed to several therapeutic factors. Patient variables account for 30% of the variance and represent variables such as coping style, motivational stage, and reactance level. The therapeutic relationship accounts for 15% of the variance, encompassing elements such as affective bond/attunement, tasks, and goals. The treatment method accounts for 10%, and represents the application of specific techniques, such as Socratic dialog, exposure, or transference analysis. The therapist represents 7% of the variance, encompassing variables such as genuineness, warmth, and empathy. Other factors such as therapeutic setting or distance from home account for 3% of the variance. Finally, the unexplained variance accounts for 35%, which is an update, because in the previous publication of the *Psychotherapy relationships that work: Evidence-based responsiveness* (2ed), (Norcross, 2011), the unexplained variance accounted for 40%, the therapeutic relationship accounted for 12% and the techniques accounted for 8%. In this sense, these 2 factors explain 5% more of the variance than before, which means that there was an improvement in the understanding of the differential weights on psychotherapy outcome. The authors do not explain this fact. Nevertheless, possible explanations may be given considering the robustness of the methodologies used, assessment measures, patient variables, therapist variables, and/or therapeutic effects. Moreover, research also documents recent findings regarding therapist variables and patient variables. Norcross and Wampold (2019) document an extensive compilation of several meta-analytic studies that supports several therapist and patient behaviors that

have a significant impact on psychotherapy outcome. These variables may be evidence-based guidelines that *should* inform clinical decision-making due to their robustness, which will be briefly described.

When it comes to the therapist variables/behaviors (what works in general), several elements of the therapeutic relationship gain prevalence. Flückiger and colleagues (2018) focused on the study of the *alliance in individual therapy*, defined as the quality and strength of the collaborative relationship (bond, goals, tasks). They documented across 306 adult studies ($N \approx 30,000$ patients), median values of Cohen d between alliance and psychotherapy outcome = .57, a medium but very robust association and a medium effect, but average d for psychotherapy vs. no treatment is .80. Tyron and colleagues (2018) studied *goal consensus and collaboration*, typically seen as a part of the alliance but necessarily. In a meta-analysis of 54 studies ($N = 7,278$) on *goal consensus*, they found a Cohen d of .49 with psychotherapy outcome. In a meta-analysis of 53 studies ($N = 5,286$) on *general collaboration*, they found a Cohen d of .61 with psychotherapy outcome. Finally, in another meta-analysis of 21 studies ($N = 2,081$), on *therapist collaboration*, they found a Cohen d of .54 with psychotherapy outcome. Farber and colleagues (2018) studied the use of *positive regard/affirmation*, defined as the means of prizing and caring for the client as a separate person. In a meta-analysis of 64 studies ($N = 3,528$ patients), they found a mean g = .28 -.36 (small-medium effect). It was emphasized that the patient rating was the best predictor of psychotherapy outcome (patient's perspective). Elliot and colleagues (2019) studied *empathy*, defined as the therapist's emotional understanding of the client's feelings and struggles from their viewpoint. In a meta-analysis of 82 studies (290 effects; $N = 6,138$), they found a mean d of .58 between empathy and psychotherapy outcome. Also, they documented higher effect sizes for CBT than for experiential, humanistic, and psychodynamic. Lambert and

colleagues (2019) studied *feedback for all patients*, defined as direct inquire about progress on a regular basis. Researchers compare those feedbacks, and address them explicitly in session. In two meta-analyses of 15 Randomized Control Trials (RCTs), using OQ (N = 8,649 patients) and 9 RCTs (N = 2,272) using PCOMS, they found that feedback had a d = .14 --.49 with psychotherapy outcome (higher effect for PCOMS and clinical support OQs), which is of modest utility when used with all patients. These studies were conducted in multiple countries with adults, couples, and youth. However, when it comes to *patients at risk* (e.g., suicidal), things are different, with stronger effects when OQ feedback and CST used with patients not progressing, which typically constitutes 30% of caseload (OQ, d = 0.50). Feedback reduced deterioration rates from an average of 30% in clients who were not progressing to 12%. This means that feedback in patients at risk has reduced by about half the chances of experiencing deterioration (identifying nonresponders and adjusting psychotherapy accordingly). Gelso and colleagues (2018) studied the *real relationship,* defined as the real relationship characterized by realism and genuineness. In a meta-analysis relating the real relationship and psychotherapy outcome, based on 17 studies (N = 1,502 patients), they found a *d* =.80, which is a strong effect size and represents a positive relationship between the real relationship and patient success. Peluso and Freund (2018) studied the *facilitation of emotional expression*, defined by the therapist behaviors that promote *emotional expression & processing*. In a meta-analysis of 13 studies, they found a Cohen *d* = .56 between therapist emotion expression and psychotherapy outcome. In another meta-analysis with 42 studies (N =925), client affective experience & expression correlated with *d* = .85 with distal outcomes. Kolden and colleagues (2018) studied *congruence/genuineness*, described as the ability of therapists to express truly their feelings and thoughts and act coherently. In a meta-analysis of 22 studies (N= 1,192

patients), they found an average Cohen d of .46 for the congruence outcome association, with higher effect sizes for older, licensed, more experienced therapists. Eubanks and colleagues (2010) studied *repairing alliance ruptures*, defined as the actions towards repairing therapeutic alliances. In 11 studies (N= 1,318 patients), the relation of rupture repair episodes with treatment outcome was $d = .62$. In 6 studies, training in rupture resolution slightly improved outcomes ($d = .22$ vs no training). According to Norcross and Wampold (2018), repairs are facilitated by responding non-defensively, attending directly to the relation, adjusting behavior, and collecting feedback. Hayes and colleagues (2018) studied the *management of countertransference,* defined as the coping abilities to deal with automatic emotional expressions towards clients, which involves self-insight, self-integration, anxiety management, empathy, and conceptualizing ability. A meta-analysis of 14 studies ($N = 973$ therapists) shows $d =-.33$ between countertransference and psychotherapy outcomes. In another 9 studies ($N = 392$ therapists), mean $d =.84$ between countertransference and psychotherapy outcome. Constantino and colleagues (2019) studied the *promotion of treatment credibility*, defined as the patient evaluation of the degree to which a treatment appears suitable and effective. In a meta-analysis of 24 independent samples ($N = 1,504$ patients), they found a Cohen $d = .24$ (small positive effect) with treatment outcome. Also, Constantino and colleagues (2019) studied the *cultivation of positive expectations*, defined as the notion that belief is half the cure (patients' expectancy and prognosis towards psychotherapy). In a meta-analysis of 81 independent samples ($N = 12,722$ patients), they found a Cohen $d = .36$ (small-medium positive effect) with psychotherapy outcome. Norcross and Wampold (2019) state that expectations matter and therapists should cultivate them along with expectancies both pre and during therapy. Finally, Hill and colleagues (2018) studied *self-disclosure and immediacy*, defined as the usage of self-disclosure when meeting the client's needs. A

qualitative meta-analysis of 21 therapy studies shows positive clinical consequences. Self-disclosure and immediacy, on one hand, enhanced therapeutic relationship (60% of clients), mental functioning (42%), and insight (38%); on the other hand, inhibited client openness (6%) and negative effect on the therapist (5%). Disclosure and immediacy can be applied especially when clients feel alone, vulnerable, in need of support, and alliance rupture repair (Norcross & Wampold, 2018).

When it comes to the *patient variables/behaviors* (what works in particular), several elements of systematic treatment selection (Beutler, 2001) seem to gain prevalence. Beutler and colleagues (2005) studied the *levels of severity and complexity,* defined as the *severity* of the problem conceptualized as a continuum with two opposite extremes (residual/minimal symptoms vs severe/disabling symptoms). The *complexity* of the problem associated with long-lasting dysfunctional patterns in the life of the owners is manifested in several domains repeatedly in adaptation and development. In an RTC ($N = 291$), CBT and Psychodynamics were compared using the systematic treatment selection. Differences in the use of systematic treatment selection were only found in psychodynamic (Watzke et al., 2010). Krebs and colleagues (2019) studied the *stages of change* (pre-contemplation, contemplation, preparation, action, & maintenance). In a meta-analysis of 47 studies, they found a Cohen d= .70 -.80 for different change processes in different stages, where stages reliably predict psychotherapy outcomes ($k = 76$, $N = 21,424$, $d = .41$). They stated that a therapist's optimal stance varies with the stage of change. Beutler and colleagues (2018) studied the *reactance level*, defined as whether the client is easily provoked and responds oppositionally to external demands. In a meta-analysis of 13 studies ($N = 1,208$), they found a large effect size ($d = .78$) for matching therapist directiveness to patient reactance. The authors stated that a high-reactance patient benefits more from self-control, minimal direction, and paradoxical interventions

and low-reactance clients benefit more from therapist directiveness and explicit guidance. Beutler and colleagues (2011) studied the *coping style,* defined as the habitual, enduring pattern of externalizing vs. internalizing. In a meta-analysis they found medium effect sizes ($d = .60$) for matching therapist method to patient coping style ($k = 18$, $N = 1,947$ patients). The authors stated that interpersonal and insight-oriented psychotherapies are more effective among internalizing patients, whereas symptom-focused and skill-building psychotherapies are more effective among externalizing patients. Levy and colleagues (2019) studied the *attachment style*, defined as the structural affective bond formed in childhood with the main caregivers who influence the relational patterns of adults in related relationships (Safe, insecure-anxious, insecure-avoidant, disorganized). In 36 studies ($N = 3,158$), they found a Cohen $d = .35$ between safe connection and effectiveness of psychotherapy. Also, CBT was shown to have slightly better results with patients with a secure connection and dynamic and relational psychotherapy were less compromised with insecure attachment styles. Soto and colleagues (2019) studied *cultural adaptations* (race/ethnicity) to clients. In a meta-analysis of 99 studies ($N = 13,813$), they found a Cohen $d = .50$ in favor of clients receiving culturally adapted treatments; "cultural fit" works. Frequent methods of adaptation identified were: 75% used clients' preferred language, 75% incorporated cultural content/values, 55% matched clients with therapists of similar ethnicity/race, 52% addressed client's context (e.g., racism). Finally, Hook and colleagues (2019) studied the accommodation versus non-accommodation of *religion/spirituality* in psychotherapy. They found in 97 studies ($N = 7,181$) that patients with religion/spirituality accommodation improved psychologically ($g = 0.33$) and spiritually ($g = 0.43$). The authors emphasized the impact of the belief and values system on the development of well-being and mental health.

b. Process models and *trait vs state vs construct* responsiveness

Different therapeutic orientations postulate different mechanisms and processes of change which are consistent with their predictions. For instance, in Schema Therapy (Young, et al., 2003), the core mechanism of change is concerned with the interplay between schema (trait) and mode (state) healing. In Acceptance and Commitment Therapy (Hayes et al., 1999), mechanisms of change are focused on a process model concerning in reducing avoidance and augmenting psychological flexibility. In Emotion Focused Therapy (Greenberg, 2015), the mechanisms of change are focused on bonding and emotional healing through emotion. Finally, the transtheoretical model of change (Prochaska & DiClemente, 1982) is focused on different motivational stages. Despite being well-established, it seems that these models work exclusively based on their theoretical conceptualizations, disregarding other possible mechanisms and processes that could also work. Thus, as described earlier, different psychological constructs may be articulated as *traits* and *states*; however, when it comes to complex constructs (e.g., states of mind), it seems that a simple *state-trait approach* is reductionist. Complex constructs encompass several cognitive-affective elements, such as beliefs, emotions, attributions, and/or coping styles (Faustino et al., 2020), which require a *construct responsiveness* approach beyond a *state-trait approach.* In this sense, one is required to combine several process models towards the specifications of the construct.

In Schema Therapy Model (Young et al. 2003), there are two major forms of intervention, one focused on early maladaptive schemas, which are regarded as *traits,* and another focused on schema modes, which are regarded as states. Young and colleagues (2003) postulate that, to work on early maladaptive schemas, a sequence of cognitive, experiential, behavioral, and interpersonal tasks to be taken, due to the conscious and the unconscious domains of these deeply rooted structures. These schemas are formed in

childhood and adolescence, therefore, most individuals are unaware of them, so individuals must first gain access to these dysfunctional themes and then they must gain critical distance from them (I am not my schema). In this sense, Young and colleagues (2003) describe a set of cognitive techniques to pursue this goal (e.g., exploration of life patterns, schema dialogue, and reattribution of experience). The authors state that after individuals gain awareness and critical distance from their schemas, it is necessary to work at an emotional level through experiential tasks (e.g., guided imagery and reprocessing, chair work). Young and colleagues (2003) state that when the schema is weakened emotionally and cognitively, it is time to rehearse behavioral and interpersonal actions that consolidate schema change. This could be defined as a *trait-approach.* Different from this approach is the intervention regarding schema modes, which are regarded as the crystallized schemas and coping behaviors that activate in a moment-to-moment fashion. Young and colleagues (2003) postulate seven steps to work on a moment-to-moment level: (1) identification, (2) association of modes and problems, (3) mode differentiation, (4) mode dialogue, (5) healthy adult strengthening, (6) consolidation of change, and (7) anticipation of future difficulties. These strategies may be defined as *state-approach*.

In Acceptance and Commitment Therapy (Hayes et al., 1999), the process of behavior change is based on the hexagonal model of psychological flexibility. This model postulates a progression through six core processes, organized in two broad categories (mindfulness and acceptance processes, and commitment and behavior change) that lead individuals to achieve a psychological balance and acceptance of their internal private experience (Hayes et al., 1999). According to Hayes and colleagues (1999, 2010), individuals need to first *accep*t their internal experience, countering affective and behavioral avoidance (step one). Second, individuals need to *defuse* their thoughts,

feelings, and behaviors from accurate truths, but rather, they need to see them as their own internal and subjective domain (step two). Third, to develop an adaptive perspective, individuals need to take a *critical distance* from the "old, crystallized self" and to understand that the self emerges in different contexts as a subjective personality domain (step three). Fourth and fifth, by doing this, individuals need to understand their life *values and goals* (step four) and to take the required steps to engage in *committed action* which is coherent with their values and goals (step five). Sixth, and finally, by doing this and to consolidate change, individuals need to be in the *present moment,* to be able to process the relational experiences in the-here-and-now (Hayes et al., 1999). This intervention may be defined as a *process approach*.

Emotion-Focused Therapy (EFT, Greenberg, 2015; Goldman & Greenberg, 2017) uses a marker guided intervention to facilitate emotional processing. At the core of disorder theory is maladaptive emotional learning associated with emotional schemes, which promotes emotional suffering and disorganization of experience. To achieve emotional softening and growth patients need to access core maladaptive emotions and to reprocess them (Ellitot et al., 2011). Goldman and Greenberg (2017) state that emotion processing difficulties manifest in the flow of the therapeutic dialogue which supports a moment-to-moment intervention. Several therapeutic tasks are defined to enhance emotional processing, such as empathic-based tasks, relational tasks, experiencing tasks, reprocessing tasks, and action tendency tasks. Empathic based tasks are focused on dealing with v*ulnerability* and *problematic reactions* with empathic affirmations and explorations. Relational tasks are focused on dealing with the beginning of *therapy* and *withdrawa*l with *alliance dialogues.* Experiencing tasks are focused on dealing with *attentional focus difficulties*, *unclear feelings,* and difficulties in *emotional expression* with *clearing space*, *experiential focusing,* and *systematic unfolding*. Reprocessing tasks

are focused on *traumatic experiences*, *problematic reaction points,* and *meaning protests*, which are dealt with trauma retelling, systematic unfolding, and meaning creation. Finally, action tendency tasks are focused on *self-critical* and *interruption splits*, *unfinished business*, and *dysregulated anguish*, which are worked through with chair work and compassionate self-soothing (Ellitot et al., 2011; Greenberg, 2015; Goldman & Greenberg, 2017). Moreover, Greenberg and colleagues emphasize that patients need to unblock emotional constrains by progressing in six stages of emotional processing: (1) awareness of emotion or identification (2) emotional expression, (3) regulation of emotion, (4) reflection on emotional experience, (5) transformation of emotion by emotion, and (6) corrective experience of emotion through new lived experiences. Finally, the therapeutic process may be divided into the bonding phase (development of alliance and attunement) and change (emotion tasks). In this sense, the EFT model seems to combine a process model of change with a moment-to-moment intervention, which may be called a *state and process approach.*

Prochaska and DiClemente (1982) elaborated on the *transtheoretical model of change* which organizes 10 processes of change around five motivational stages. These five stages reflect the individual's readiness to take actions for behavior change and are defined as pre-contemplation (not ready), contemplation (getting ready), preparation (ready), action (current inaction), and maintenance (monitoring change). In each stage patients present themselves with typical thoughts and behaviors that reflect internal conflicts, ambivalence, or readiness. Along with the motivational stages, Prochaska and DiClemente (2005) defined 10 processes of change that patients need to go through to progress to the next stage. Consciousness-raising (get the facts), environmental reevaluation (notice your effect on others), dramatic relief (pay attention to feelings), and self-reevaluation (create a new self-image) are applied in the *pre-contemplation* and

contemplation stages. Self-reevaluation also extends to the *preparation* phase. Self-liberation (commit), helping relationships (get support) and counterconditioning (use substitutes) are applied in the *preparation* and *action* stages. Helping relationships and counterconditioning also extend to the *maintenance* stage. Finally, reinforcement management (use rewards) and stimulus control (manage environment) are applied in the *action* and *maintenance* stages (Prochaska & DiClemente, 2005). Furthermore, Prochaska and DiClemente (2005) introduced the *levels of change construct,* which defines five different levels at which change may occur. At level one, change may occur on *symptoms and situational problems.* At level two, change may occur on current *maladaptive cognitions* (i.e., schemas). At level three, change may occur on *current interpersonal conflicts* (i.e., conflicts with colleagues). At level four, change may occur on *family or systems conflict.* And at level five, change may occur on *long-term intrapersonal conflicts.* In this sense, this model may be defined as a *stage-process approach.* Which is the best model? Research on specifics of the process of change is sparse and limits integration between several models.

c. Identification of phase-by-phase general strategies

Psychotherapeutic processes tend to unfold over time, following a time progression for both psychotherapists and patients (Vasco & Conceição, 2008). Several theoretical models have postulated different stages for phase progression in psychotherapy (Beitman, 1987; Benjamin, 2018; Elliot et al., 2004). However, one model stands out from the other ones due to several years of supporting research. Based on Goldfried's (1980) work of general principles of change, Vasco and colleagues (2018) developed an integrative model based on a temporal sequencing of strategic principles

(middle level of abstraction), which tends to favor patients' progress through the therapeutic process (Ferreira et al., 2017a).

Embedded in the Paradigmatic Complementarity Model (Vasco et al., 2018), this time sequence model is divided into seven phases related to the implementation of several therapeutic strategies: Trust, motivation, hope building and structuring (phase 1), Increasing awareness of self and experience (phase 2), Meaning-making regarding self and experience (phase 3), Regulation of responsibility (phase 4), Implementation of repairing actions (phase 5), Consolidation of change (phase 6) and Anticipation of the future and relapse prevention (phase 7) – see figure 6.

7e. Realize that he/she can cope autonomously with life's future challenges.
7d. Integrate experiences from the past, present and anticipated future into a coherent self-narrative.
7c. Strengthen the feeling of self-coherence and purpose in his/her life.
7b. Anticipate resources required to cope with future scenarios beyond the termination of the therapeutic process.
7a. Project himself/herself in the future, effective and affectively relating to self, others and the world.

6e. Develop relationships/situations that support his/her choices.
6d. Generalize the expression of his/her identity to the different domains of his life.
6c. Accept the inevitability of a certain degree of vulnerability or conflict as result of experiencing and expressing his/her identity.
6b. Emotionally nurture and nourish himself/herself regarding the expression of his/her identity and growth.
6a. Deal with internal or external obstacles to the consolidation of his/her identity and growth.

5e. Effectively deal with situations and respect his/her needs at the same time.
5d. Ecologically act in ways where he/she expresses himself/herself with clarity and congruence regarding his/her needs.
5c. Integrate different parts or needs within himself/herself into a congruent and satisfied enough whole.
5b. Stand up for himself/herself by dealing with internal or external blocks to the expression of his/her identity.
5a. Choose life-styles that allow himself/herself to live the present as well as to promote his/her personal development.

4e. Recognize himself/herself as the only agent of his/her own choices.
4d. Understand when and how he/she contributes to his/her usual difficulties.
4c. Acknowledge that he/she can promote or hinder the satisfaction of his/her needs.
4b. Take responsibility for taking care of himself/herself by tentatively mobilizing internal or external resources toward that goal.
4a. Commit to respecting and validating his/her needs, regardless of their correspondence to others' expectations.

3e. Form new plausible links or explanations for his/her problematic attitudes and behavior.
3d. Understand what he/she is trying to attain when behaving in hindering ways.
3c. Overcome the processes that hinder awareness of experience of helpful meaning making.
3b. Identify existing patterns in his/her usual ways of functioning.
3a. Make sense of his/her problematic experiences in terms of past or present circumstances.

2e. Translate problematic experience into its elements (e.g., cognition, emotion, behavior).
2d. Feel curious and interested in observing how he/she treats himself/herself.
2c. Become aware of parts or needs (of) within himself/herself which are in conflict.
2b. Increase awareness of how he/she relates to others and others relate to him/her.
2a. Explore or experience the impact of relevant situations on himself/herself.

1e. Feel motivated to approach his/her problems from a psychological standpoint.
1d. Experience the setting as safe and trust (in) therapist's ability to help him/her.
1c. Negotiate the structure and the rules of the therapeutic process in order to make it viable.
1b. Feel a collaborative relationship with the therapist.
1a. Feel hopeful that he/she might improve with the help of psychotherapy.

Figure 6. Sequential components for the seven phases of the Paradigmatic Complementarity Model (Adapted from Vasco et al, 2018).

In *phase one,* the focus of the therapist is on developing trust, motivation, and hope, structuring the relationship, and building an adequate therapeutic alliance. The therapist needs to listen and validate the patients' problems, along with the negotiation of rules and goals of the therapeutic relationship. In *phase two,* the focus is on increasing awareness of self and experience, and the therapist helps patients to become aware of difficulties, conflicts, and problematic experiences on the relationships with oneself and others (e.g., cognition, emotion, and behavior). In *phase three*, the therapist is focused on the development of new meanings related to experience and self, helping patients clarifying and relating feelings and cognitions, increasing their knowledge regarding how past/present experiences may contribute to the origin and maintenance of the problem. In *phase four*, the therapist helps the patient to promote and regulate responsibility, by increasing patients' awareness and differentiation regarding their needs by considering self-efficacy and resources for change, problematic choices and responsibilities. In *phase five*, the therapist facilitates the implementation of repairing actions, helping individuals to express themselves and to deal with life situations according to their own needs. In *phase six*, the therapist promotes the consolidation of change by helping patients deal with the self and interpersonal obstacles to self-consolidation and harmonization of different parts of the self. Finally, in *phase seven,* the therapist helps patients when it comes to anticipation of the future and relapse prevention. Therapists help patients to anticipate difficulties, and to develop resources to manage them and potential future gratifications for the new self (Vasco et al., 2018). Fundamentally, this sequence tracks the process of the patient's general capacities and/or vulnerabilities about processing meaningful clinical variables, and allows one to be responsive to that patient's styles of communications, abilities, and needs. The goal is to not rush into the more advanced stages if the skills inherent to the previous stages are not sufficiently grounded and the

patient is still unable to process the more advanced ones (Conceição, 2005, 2010). Moreover, previous research has given adequate support for this stage model.

The present model has been systematically studied in the last 18 years with transversal and longitudinal methodologies, based on the General Strategies Index (Conceição, 2010). Clinical studies showed that this sequential model was able to track phase-by-phase progressions of different clients along with different stages. The assimilation and the accommodation of stage-dependent gains were essential to the skills of different patients, which can be seen as the core mechanisms of change (Ferreira et al., 2017a,b). According to Conceição (2005, 2010), the articulation of the promotion of a therapeutic task by the therapist with the patient's ability to assimilate those proposals seeded in specific phase challenges may contribute to improving both psychotherapists' and patients' view of the therapeutic alliance. Vaz (2018) found mediational effects based on patients' emotional experiences. Changes from Phases 1-3 to Phases 4-7 were mediated by a decrease of unpleasant emotions. Changes in these phases were also mediated by an increase of self-perceived abilities to differentiate and express emotions. Also, the abilities of emotional attention, regulation, and expression were not associated with phase progression in the PCM model.

Concluding Thoughts

A science-based approach to the process of change supports the notion of reliable and valid knowledge applied to psychotherapy. As described previously, the explained variance in psychotherapy can be differentiated in several factors: patient variables (30%), therapeutic relationship (15%), techniques (10%), individual therapist (7%), other factors (3%), and unexplained variance (35%). These factors were explored in several meta-analytic studies, which found several general (e.g., therapeutic alliance, validation)

and specific (e.g., emotional stability, coping style) elements in psychotherapy that reveal medium to strong associations with psychotherapeutic outcome. However, there is still 35% of unexplained variance, which means that there is still a long road to explore, which supports the present doctoral proposal.

Several process models may help to explain state and trait fluctuations within psychotherapy. Thus, clinically speaking, it is sometimes very difficult to differentiate dispositional traits and contextual states. A new perspective, called *construct responsiveness* may be suited to bypass this issue, by adopting a more flexible approach based on the psychological structures that are activated (e.g., maladaptive schema, coping, motivation or state of mind). This will be explored through the exploration of trait state stability, along with the exploration of associations with a process model of psychotherapy, by understanding how these constructs may be stable over a period of 6 months.

6.   Theoretical Integration

This chapter is focused on an elaboration regarding the theoretical integration of the concepts described previously. As stated in the previous chapter, Norcross and Wampold (2019) described several meta-analytic studies which can only explain 65% of psychotherapy outcome, divided into patient variables (30%), therapeutic relationship (15%), techniques (10%), individual therapist (7%), and other factors (3%). There is still 35% of unexplained variance that opens up avenues for the development and articulation of new/old constructs within an integrative, transtheoretical and metatheoretical perspective. Therefore, the present doctoral proposal tries to combine a metatheoretical and multidimensional approach to human complexity and considers different levels of analysis and abstraction.

To better understand the main framework of this project I will describe a theoretical integration of those constructs. First, each element of this model may be regarded on a five-axis spectrum: flexibility/structure, integration/dissociation, specific/generalized, psychological/neurobiological, and correlational/longitudinal. In the first axis (flexibility/structure), psychological constructs may be conceptualized as involving different degrees of flexibility or inflexibility. As an example, a maladaptive schema of instability/abandonment may be identified as more rigid than a subjugation schema. In the second axis (integration/dissociation), psychological constructs may be regarded as integrated or dissociated. As an example, an individual may have several states of mind of which he is poorly aware, and he cannot identify if they have distressful or coping functions. In the third axis (specific/generalized), psychological constructs may be regarded through the lens of their specification or generalization. As an example, a coping strategy may be used only to cope with sadness in each context and not tend to be used in a generalized manner. In the fourth axis (psychological/neurobiological),

psychological constructs in this model may be regarded according to their primordial substrate. For instance, executive functions tend to be regarded as neurocognitive functions due to their saturation on the neuropsychological process, while schematic functioning tends to be regarded as a psychological domain. Finally, in the fifth axis (correlational/longitudinal), psychological constructs may be conceptualized through their temporality or stage-like description. As an example, the relationships between symptoms and maladaptive schemas may be correlational but the relationship between complex trauma and symptoms may be longitudinal - see table 1.

Table 1. The dialectical axis of analysis of the present proposal

Complexity axis regarding the structural analysis of the constructs				
Flexibility/structure (Axis 1)	Integration/dissociation (Axis 2)	Specific/generalized (Axis 3)	Psychological/neurobiological (Axis 4)	Correlational/longitudinal (Axis 5)
Exploration of the structural flexibility of constructs (e.g., schemas and states of mind).	Conceptualization of different constructs based on the assimilation within the self (e.g., dissociated states).	Definition of the expansiveness of several psychological constructs (e.g., conditional, or unconditional).	Identification of underlying substrate of several psychological and neurobiological constructs (e.g., schemas and executive functions).	Selection of adequate research exploration regarding study aims, based on the specifications of different psychological constructs.

Moreover, this model also encompasses five levels of abstraction, each one with several dimensions. The first level of abstraction (lower level on abstraction) is focused on the concrete and the objective psychological our neuropsychological constructs that will be explored (e.g., schemas, temperamental affective styles, metacognition, and inflexibility). This level may be organized into domains of schematic functioning, affect, interpersonal, defenses, neurocognition, processes, and stages. The second level of abstraction (lower-intermediate level of abstraction) is focused on the comprehensive and integrative case conceptualization where the previous psychological constructs are framed. These domains are the *intra-psychic level* (self-self), *dyadic-psychic level* (self-

other), *triadic-psychic level* (self-others), and *mesosystem level* (self-others-contexts). The third level of abstraction (intermediate level of abstraction) is focused on the theoretical general four conceptual domains that are encompassed in the framework of this model. These domains are defined as an *integrative disorder theory*, a *case conceptualization map*, and an *intervention guide/responsiveness focused on core dysfunctional psychological constructs*. The fourth level of abstraction (intermediate-higher level of abstraction) is focused on the transtheoretical level of the present work, where different approaches and models are integrated and combined to support the proposed model (e.g., unifying psychotherapy project, schema therapy, complementarity metamodel). The fifth level of abstraction (higher level of abstraction) is focused on the higher-order meta-paradigmatic level regarding a *philosophical/ontological perspective*, which supports a theoretical integration of *clinical psychology and psychotherapy* change principles with *neuroscience-based* principles into a theoretically and empirically supported coherent framework of knowledge. Finally, this project is based on a translational and multidimensional approach to human complexity and I have described systematically the structure of this model – see table 2.

Table 2. Levels of abstraction present proposal

Different levels of abstraction				
First level (lower level)	Second level (lower-intermediate)	Third level (intermediate level)	Fourth level (intermediate-higher)	Fifth level (higher level)
Schemas, states of mind, affective styles, metacognition, inflexibility.	Intra-psychic level dyadic-psychic level triadic-psychic level and mesosystem level.	Integrative disorder theory, case conceptualization map and intervention guide/responsiveness	Unifying psychotherapy project, schema therapy, complementarity metamodel.	Philosophical/ontological perspective, which supports the integration of psychotherapy change principles with neuroscience-based principles.

What is described previously is the philosophical perspective and framework that was used to coherently articulate the several components of this research project.

Moreover, the present proposal aims to test several relationships between different variables within a transtheoretical perspective. As described before, these variables encompass several low-level abstraction elements, which need to be clustered to make sense in the present proposal and so that they may be turned into testing variables. In this sense, the several variables under study will be framed in several domains: early disorder determinants, maladaptive schematic functioning and states of mind, defenses and critical consequences, mental skills and processes, non-conscious emotional processing, neurocognition, and research-based clinical profile variables.

Early Disorder Determinants are all significant variables or factors that have a major role in the development and/or maintenance of last-longing emotional suffering, cognitive-perceptual self-impairment, interpersonal behavior dysregulation, and systematic non-adaptation. These factors have pervasive impacts on schema formation and in the development of defensive maneuvers. These variables may also be described as antecedent factors. In the present study, these variables are the following: early complex trauma, affective temperament, parenting styles, psychological needs, and symptomatology. *Maladaptive schematic functioning and states of mind* are the dysfunctional mental structures, with several mental elements (e.g., rigid beliefs and expectations, dysfunctional self-images, autobiographic memories, non-adaptive emotions), which encapsulate the pervasive meanings and learnings reflected on past dysfunctional experiences that are the foundational blocks of the vulnerable, weak, fragile or depleted self. In the present study, these variables are early maladaptive schemas, emotional schemas, interpersonal schemas, and states of mind.

Defenses and Critical Consequences are the maintenance implicit/automatic and/or explicit/deliberate processes and/or consequences that individuals engage to avoid, suppress, distort, or confront to deal with emotional suffering or stressful

situations/contexts based on internal or external appraisals. These processes are responsible for schema maintenance and in the present study are the following: defensive styles, coping strategies, dysfunctional interpersonal cycles, and emotion processing difficulties. *Mental Skills and Processes* are the structural and functional low-level and higher-order mental processes that research showed to be highly significant to mental processing and affective regulation. These processes may be theoretically related to neurocognitive processes, such as executive functions, complex attention, autobiographical memory, and self-perception. In the present study, they are the following: metacognition, psychological inflexibility, cognitive reappraisal, and experiential suppression.

Table 3. Brief description of the personality core domains under study.

	Personality Core Determinants and Domains
Early Disorder Determinants *Early Complex Trauma* *Affective Temperament* *Parenting Styles* *Psychological Needs* *Symptomatology*	All significant variables or factors that have a major role in the development and/or maintenance of last-longing emotional suffering, cognitive-perceptual self-impairment, interpersonal behavior dysregulation, and systematic non-adaptation. These factors have pervasive impacts on schema formation and in the development of defensive maneuvers. These variables may also be described as antecedent factors.
Maladaptive Schemas and States of Mind *Early Maladaptive Schemas* *Emotional Schemas* *Interpersonal Schemas* *States of Mind*	Dysfunctional mental structures, with several mental elements (e.g., rigid beliefs and expectations, dysfunctional self-images, autobiographic memories, non-adaptive emotions), that encapsulate the pervasive meanings and learnings reflected on past dysfunctional experiences that are the foundational blocks of the vulnerable, weak, fragile or depleted self.
Defenses and Critical Consequences *Defensive Styles* *Coping Strategies* *Dysfunctional Interpersonal Cycles* *Emotion Processing Difficulties*	Maintenance implicit/automatic and/or explicit/deliberate processes and/or consequences that individuals engage to avoid, suppress, distort, or confront to deal with emotional suffering or stressful situations/contexts based on internal or external appraisals. These processes are responsible for schema maintenance.
Mental Skills and Processes *Metacognition and Mentalization* *Psychological inflexibility* *Cognitive Reappraisal* *Experiential Suppression*	Structural and functional low-level and higher-order mental processes that research showed to be highly significant to mental processing and affective regulation. These processes may be theoretically related to neurocognitive processes, such as executive functions, complex attention, autobiographical memory, and self-perception.

Adaptative Self Domains *Attachment/Belonging* *Self-Confidence/Coherence* *Acceptance/Mindfulness* *Compassion/Emotional Fulfilment*	Healthy personality domains that are developed to counterbalance maladaptive schemas and/or traits. Encapsulates the adaptive schematic functioning that results from the adaptive meaning-making that stemmed from satisfactory early and later emotional and relational experiences.
Research-Based Clinical Profile *Client's perspective of the stage* *Therapeutic relationship,* *Motivational level* *Reactance style* *Attachment style* *Emotional stability*	All variables are related to the decision-making process that were found to be related with outcome. These variables are empirically based and serve to guide specific clinical interventions regarding patient variables that are related to psychotherapeutic outcome.

Adaptive-Self Domains are the healthy personality domains that are developed to counterbalance maladaptive schemas and/or traits. Maladaptive schemas are the consequence of maladaptive early experiences, however, not all early experiences are toxic, which means that individuals also develop adaptive healthy self domains based on adaptive experiences. Thus, these healthy domains encapsulate the adaptive schematic functioning that results from the adaptive meaning-making that stemmed from satisfactory early and later emotional and relational experiences. In the present study, they are the following self-domains: attachment/belonging, self-confidence/coherence, acceptance/mindfulness, and compassion/emotional fulfillment. *Research-based clinical profile variables* are empirically based variables that were shown to be highly associated with psychotherapy outcome and may enhance the therapist's responsiveness in the several stages of psychotherapy. These variables are the client's perspective of the stage in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style, attachment style, and emotional stability – see table 3.

This project encompasses a true integration of psychology and neurosciences by acknowledging the variables described below. *Non-conscious emotional processing* is the index that will be described in the experimental task with EEG measurement. These

variables are related to the decision-making process regarding three conditions (positive, negative, and neutral), which reflect the non-conscious reactions to several stimuli. This task is embedded in the affective neuroscience research paradigm. *Neurocognition* is all the core neuropsychological processes that individuals need to process information daily. As described before, these variables are highly associated with brain functioning and are essential in daily activities. In the present study, these variables are executive functions, attention, memory, perception, and language. These variables are typically studied in clinical neuropsychology.

Table 4. Brief description of the personality core domains under study.

	Neuroscience and Neurocognitive variables
Neurocognition *Executive Functions* *Attention and Memory* *Perception* *Language*	Neurocognitive processes are highly associated with brain functioning and are responsible for attention, memory, executive functions, and reasoning. These variables are essential for daily life activities and everyday behavior.
Non-conscious emotional processing *Valence* *Arousal*	Variables regarding the implicit or unconscious emotional processing regarding affective stimulus manipulated experimentally.

All these variables have several associations and contributions for adaptive and maladaptive psychological and neuropsychological functioning. Individuals are born with several cognitive, neurocognitive, affective, behavioral, physiological, and relational tendencies that express genetic heritage. These individual tendencies will be continuously shaped and reshaped through private and relational experiences which will be weakened or reinforced through time. Several elements contribute to different dispositional traits and contextual states that start to emerge from the dynamic process between experiences (e.g., early complex trauma), parenting styles, affective temperament, and the learning

about how to regulate emotional core needs. Later, meaning-making processes help to elaborate stable structures encompassing several experiential cycles (e.g., emotion and cognition), which are differentiated into dispositional traits, schemas (e.g., thematic, emotional, and relational), and states of mind with different functions. Some schemas will be focused on cognition, other schemas will be focused on emotions and some states will encompass the adaptive learnings and conclusions that individuals elaborated on past adaptive experiences. Some states of mind will acquire coping purposes while others will acquire adaptive purposes. Also, it is important to emphasize that the *schema* construct is still in development, due to theoretical divergences regarding specific schema elements. Thus, the present proposal aims to explore if there is empirical support for different schema conceptualizations (e., cognitive schemas, and emotional schemas).

Based on the dysfunctional emotional intensity of past experiences, maladaptive schemas will be developed and become part of the self, fostering the development of several implicit defensive styles that will align with coping strategies to avoid, subjugate, suppress, transform, or overcompensate painful autobiographic memories. Thus, this will manifest implicitly on the non-conscious emotional processing. These processes allow individuals to overcome partially the pain of the past experiences and dysfunctional learning, but contribute to schema maintenance, maladaptive functioning, symptomatology, and lifelong psychological disorders, by not allowing the self to become fully aware of the painful memories, disrupting cognitive, affective, behavioral, relational, and neurobiological corrective experiences. Moreover, along with the developing states, several mental skills, processes, and neurocognitive abilities start to develop with stage congruent challenges. If challenges match individuals' abilities, these processes will acquire structural properties when it comes to the development of

metacognitive skills, emotion regulation, and neurocognitive abilities, such as executive functions, attention, or memory – see figure 1.

One of the strengths of the present work is the articulation of all these variables into a coherent theoretical model that allows exploring several processes at different levels of abstraction. These specific theorizations were made previously on several models; however, the theoretical integration was not performed. Thus, the present proposal suggests a fully integrative model with several axes, levels of abstraction, and psychological and neurobiological variables to support a full empirical study articulated coherently. Therefore, based on this conceptualization, seven studies were elaborated to test specific assumptions of the present work. The next section will describe how all these relationships were tested and whether the empirical data supported or not all the theoretical assumptions.

Figure 6. A generic model of the variables under study.
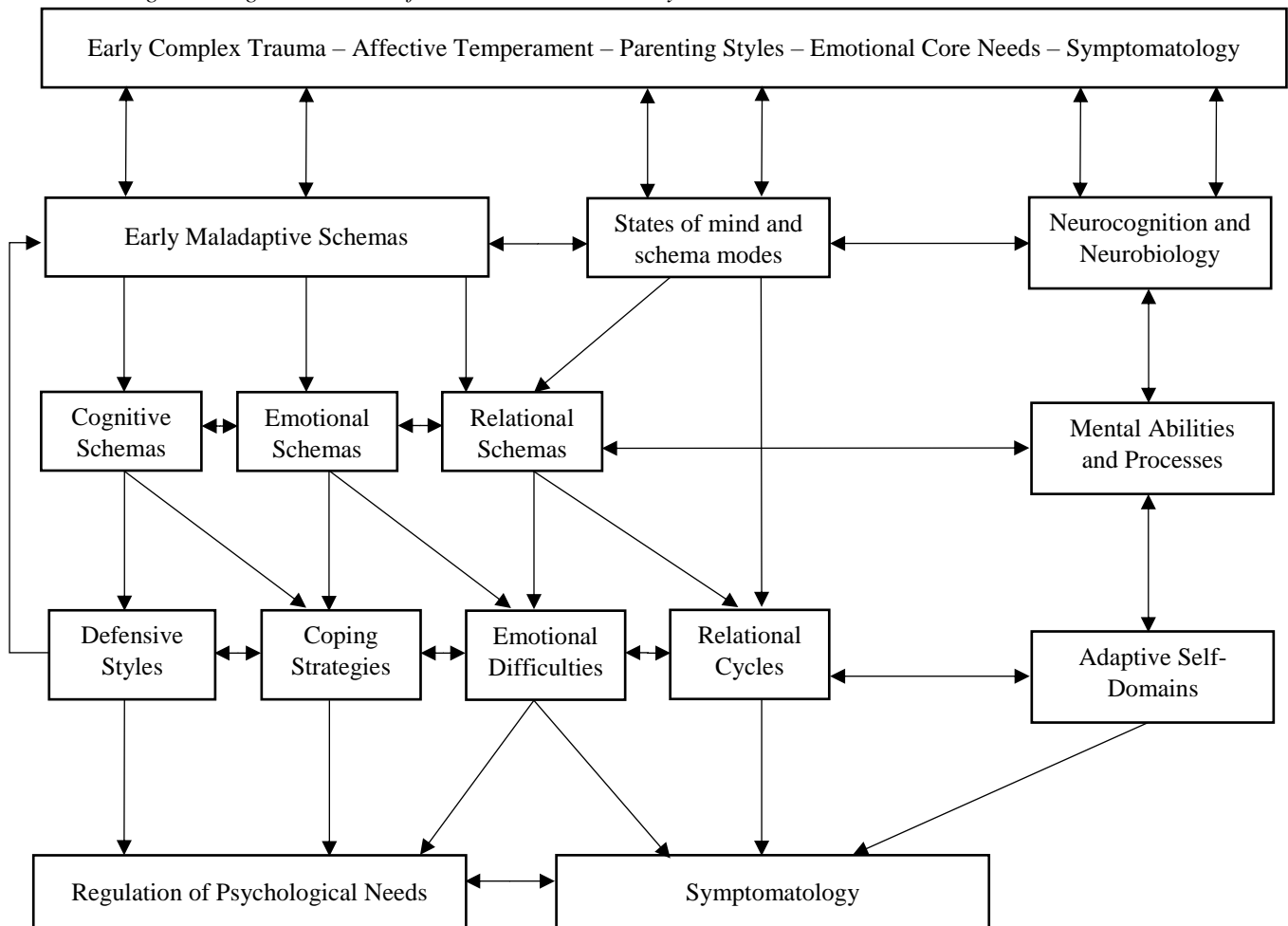
METHODOLOGY AND PROCEDURES

1. *General Procedures*

The present study was conducted at the Faculty of Psychology of the University of Lisbon, during 2018/2019, 2019/2020, and 2020/2021. All participants were engaged in the five year Integrated Master´s program in Psychology. Participants were recruited in the beginning of the scholar year in several classes. A detailed explanation about the study participation was given, wherein it was explained that this study has a cross-sectional and longitudinal design with different modalities of participation, including self-report questionnaires, neuropsychological assessment, and neurophysiological experimental task. Individuals were allowed to opt to participate in only one task or in all tasks. If participants were interested, they filled a document with their email and student number. An email was sent with the link to the Qualtrics platform and a google Excel doc. to schedule the neuropsychological assessment and the neurophysiological experimental task. Then, individuals were required to complete all questionnaires within 5 days on the Qualtrics platform and had 5 days to complete scheduled tasks. If they agreed, they were contacted after 6 months to repeat the procedure. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. A bonification was given to each participant who completed the entire battery. The inclusion criteria were being over 18 and lower than 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder.

2. *Self-Report Instruments and Procedures*

Procedures

Regarding the questionnaires, the participants, after receiving the email with the link, had about 5 days to finish the complete battery. The battery of questionnaires consisted of four parts, each with several questionnaires. Questionnaires order was randomized to avoid the effects of contagion from one instrument to another. After completing each part, the participants received the instruction to leave the platform for 5 hours, and to come back within 24 hours.

Initially, online consent and investigation instructions were presented. Then, participants had to respond to several sociodemographic variables (e.g., age, gender, marital status) and whether they were engaged in a psychotherapy process. If so, they had to respond to some questions related with the process, such as frequency of appointments (yes / no), medication (yes / no), and degree of motivation, degree of emotional discomfort, stage of the psychotherapeutic process, therapist's proposed reactions and perception of therapy. Finally, the first part began with several questionnaires. Each part lasted between 30 to 40 minutes. After finalizing the 4 parts of the questionnaire battery, the participants were contacted to schedule the other sessions in the laboratory.

Young Schema Questionnaire (YSQ-S3)

Early Maladaptive Schemas were assessed by the YSQ-S3 (Young, 2005, translated and adapted for Portuguese Population by Rijo, 2009, 2017). The YSQ-S3 is a self-report measure with 90 items aimed at assessing eighteen maladaptive schemas, divided in five categories: disconnection and rejection, impaired autonomy and performance, other's domain, impaired limits, and overvigilance and inhibition. It has a

response format in 6-point Likert scale ranging from 1 (does not describe me at all) to 6 (describes me totally). The scale also has a general index. Rijo (2017) reported satisfactory psychometric properties in the validation study of the YSQ-S3 for the Portuguese population (N=1,226). An adequate model fit for 18 factors ($\chi2$=2430.234; p=.000) and adequate values of Cronbach's alphas, which ranged from weak in impaired self-control schema (α=.65) to strong in failure schema (α=.86), were described. Moreover, all schemas correlated positively with the Beck Depression Inventory (BDI, Beck, 1975) (p <.001), which may be viewed as evidence of convergent validity (Rijo, 2017). In the present study a general index score was used.

Emotional Processing Difficulties Scale-Revised (EPDS-R)

Emotional processing difficulties were assessed through the EDPS-R (developed by Barriera and Vasco, 2016 and revised by Faustino and colleagues 2021b). The EDPS-R is a self-report measure with 22 items aimed at assessing five emotional processing difficulties, namely nuclear felt meaning, problematic reaction; self-critical split, self-interruption split and unfinished business. It has a 5-point Likert scale ranging from 1 (never) to 5 (always). Faustino and colleagues (2021b) reported satisfactory psychometric properties, with an adequate modle fit (χ^2=3150, 534), p <.000) in Exploratory Factor Analysis (EFA) and Cronbach alfas ranging from self-interruption Split (α = .70) to absence meaning, (α = .88). Also, the total index score was considered excellent (α = .91). EDPS-R also showed evidence of convergent validity with Difficulties in Emotional Regulation Scale (DERS, Gratz & Roemer, 2004), through positive correlations between subscales (p <.001). In the present study a general index score was used.

Needs Satisfaction Regulation Scale (NSRS-43)

The NSRS-43 (Vasco et al., 2012) was used to assess the regulation of psychological needs. The NSRS-43 is a self-report measure with 43 items focused on the assessment of whether individuals can regulate their own psychological needs. It has an 8 point Likert scale ranging from 1 (totally disagree) to 8 (totally agree). This scale has fourteen dimensions/subscales conceptualized dialectically, which represents the fourteen psychological needs, namely pleasure/pain; proximity/differentiation; productivity/leisure; control/cooperation; actualization and exploration/tranquility; self-coherence/incoherence and self-esteem/self-criticism (Vasco et al.,2018). Also, it has a general index, which was used in the present study. Satisfactory psychometric properties were reported in the original study (*N*=848), wherein internal consistency ranged from medium in self-incoherence (α=.72) to strong in self-esteem (α=.92). Vasco and colleagues (2012) described evidences of convergent validity through positive correlations of the NSRS-43 general index with well-being (*r*=.73, p<.05) from the Mental Health Inventory (MHI, Ware et al., 1971) and with the total index (*r*=.85, p<.05) of the Basic Need Satisfaction Scale (BNSS, Deci & Ryan, 2000). In the present study a general index score was used.

Metacognition Self-Assessment Scale (MSAS)

Metacognition was assessed by the MSAS (Pedone et al., 2017, translated and adapted for Portuguese Population by Faustino, Branco Vasco, Oliveira, Lopes & Fonseca, 2019), which is a self-report instrument with 18 items focused on the assessment of metacognitive domains and functions. It has a 5-point Likert scale ranging from 1 (never) to 5 (always). Higher scores indicate higher metacognitive abilities. This scale

measures five metacognitive abilities distributed by four dimensions: (1) self-self-reflexivity (monitoring and integration), (2) differentiation and decentering, (3) self-other (understanding others mind) and (4) mastery (resolving problems and self-regulation). It also has a general index factor. Faustino and colleagues (2019) described preliminary satisfactory psychometric properties in the adaptation study of the MSAS for the Portuguese population (N=194). An adequate model fit (χ^2=1454,865, p <.001) for EFA is reported, with an internal consistency ranging from medium in mastery (α=.73) to high in self-self-reflexivity (α=.84), and in the total index the internal consistency was considered good (α=.84). Test-retest stability was considered adequate in the total index (r =.85) and subscales, namely self-other (r =.47, p <.001) to mastery (r =. 83, p <.001). Evidences of convergent validity were obtained through negative correlations between MSAS total index and subscales with Metacognitions Questionnaire (MCQ, Wells & Cartwright-Hatton, 2004) total index and subscales (p <.001). In the present study a general index score was used.

Inventory of Interpersonal Problems (IIP-32)

Interpersonal Styles were assessed through the IIP-32 (Barkham. Hardy & Startup. 1996, translated and adapted for Portuguese Population by Faustino & Vasco 2020). IIP-32 is a self-report inventory aimed at assessing 8 interpersonal domains through 32 items, namely, *domineering/controlling*, *intrusive/needy*, *self-sacrificing*, *overly accommodating*, *nonassertive*, *socially avoidant*, *cold/distant*, and *vindictive/self-centered*. It has a 5-point Likert scale ranging from 0 (untrue) to 4 (extremely true) and it has a general index which accounts for the total scale. In the Adaptation study (N=250), Faustino and Vasco (2020) reported satisfactory psychometric properties with an adequate model fit (χ^2=3748, 659922, p <.001) for EFA, and Cronbach alfas ranging from

medium in *non-assertive* subscale (α = .63) to high in *domineering/controlling* subscale (α = .88). In the total scale the alfa was excellent (α = .93). Evidence of convergent validity was found through the positive correlations between IIP-32 subscales and personal discomfort subscale (*p* <. 001), from the Interpersonal Reactivity Index (IRI, Davis, 1980, translated and adapted for Portuguese Population by Limpo et al., 2010). In the present study a general index score was used.

Brief symptom inventory (BSI-53)

Psychopathological symptomatology was assessed through BSI-53 (Derogatis, 1993, translated and adapted for Portuguese Population by Canavarro, 1999). BSI-53 is a self-report instrument with 53 items with a five-point Likert scale, ranging from 0 (never) to 4 (many times). This instrument has a General Index Score (GIS) and nine subscales (e.g., somatization, depression, interpersonal sensitivity). In the Portuguese validation study (*N*=404) internal consistencies ranging from weak in psychoticism subscale (α = .62) to strong in somatization subscale (α = .80) were reported. Evidence of test-retest reliability was considered adequate for *GIS* (*r* = .79, *p* < .001). In the present study the general index score was used.

States of Mind Questionnaire (SMQ)

States of mind were assessed by the SMQ (Faustino and colleagues, 2021a). The SMQ is a self-report measure focused on the assessment of 24 states of mind, clustered thematically into four higher order categories of the self: *suffered/vulnerable, coping*, *egosintonic* and *healthy* self, which represent different functions and experiences of the self. The *suffered/vulnerable* self encompasses states of mind such as *abandonment/non-*

lovability, *shame/fear of judgment* or *relational danger*. The *coping* self encompasses states of mind such as *devitalized emptiness,* or *perfectionism/overload.* The *egosintonic* self encompasses states of mind such as grandiosity or pleasure-seeking. Finally, the healthy self encompasses states of mind such as *acceptance and forgiveness/mindfulness* or *self-compassion/emotional fulfillment.* The SMQ has 80 items which can be scored on a 6-point Likert scale ranging from 1 (do not describe me) to 6 (describe me totally). Faustino and colleagues (2021), in the development study (*N*=427), reported satisfactory psychometric properties with an adequate model fit (χ^2=22852,857, *p* <.001) for EFA, and Cronbach alfas ranging from medium in *acceptance and forgiveness/mindfulness* subscale (α = .62) to high in *devitalized emptiness* subscale (α = .89). Internal consistency in the four higher order categories of the self was high, namely suffered/vulnerable states (α = .95), coping states (α = .93), egosyntonic states (α = .82), and healthy self-states (α = .91). Internal consistency in the total score was (α = .91). Evidence for test-retest reliability was considered adequate for total score (*r* =. 67, *p* <.001). Convergent validity was described through Pearson correlations (*p* <.001) with early maladaptive schemas (YSQ-S3) and psychopathological symptoms (BSI-53).

Emotional Schemas Scale (ESS-50)

Emotional Schemas were evaluated through the ESS-50 (Lehay et al., 2012, translated and adapted for Portuguese Population by Silva and colleagues, 2021). ESS-50 is a self-report instrument with 50 items focused on the assessment of fourteen emotional schemas, which are defined as the beliefs and coping strategies that individuals use to cope with emotions. It has a 6-point Likert scale ranging from 1 (very untrue to me) to 6 (very true to me). In the preliminary validation study, Cronbach alfas ranged from weak in the higher values subscale (α = .24) to high in the comprehensibility subscale (α = .80).

Convergent validity was described through Pearson correlations (p <.001) with depression and anxiety (BSI-53), with satisfactory results. In the present study a general index score was used.

Emotion Regulation Questionnaire (ERQ)

Emotion regulation was evaluated through the ERQ (Gross & John, 2003, translated and adapted for Portuguese Population by Vaz & Martins, 2009). The ERQ is a self-reporting instrument with 10 items on a six-point Likert scale, ranging from 1 (totally disagree) to 10 (totally agree), aimed at assessing two emotional regulation strategies: cognitive reappraisal and expressive suppression. Satisfactory internal consistency was documented in the original study for cognitive reappraisal (α = .79) and expressive suppression subscale (α = .73).

Interpersonal Relational Patterns Questionnaire (IRPQ)

Relational Patterns were assessed through the Relationship Patterns Questionnaire (Kurth and Pokorny, 1999), which is based on the SASB (Structural Analysis of Social Behavior) model and on the structure empirically derived from the CCRT (Core Conflictual Relationship Theme) method. IRPQ (Portuguese version by Martins, Vasco, Lind & Bakonyi, 2016) is a self-report instrument focused on the assessment of relational patterns that individuals develop with significant others. The questionnaire presents the subject with a set of predefined interpersonal hypotheses, against which he is asked to evaluate, on a 5-point Likert scale (0 = strongly agree and 4 = strongly disagree), to what extent he (SR items) or the other person interacting with the subject (RO items) is likely to use a particular response for each situation presented. For example, for an RO behavior:

"If the other accepts me". There are four possible answers: (1) "I accept"; (2) "I speak openly with him"; (3) "I criticize you"; (4) "I justify myself." Finally, the subject is asked to determine how he is treated during interactions (introjection items) (Korner et al., 2006). The internal consistency of the original instrument varies between .70 and .89 (Korner et al., 2006). In the preliminary study, Cronbach alfas ranged from medium in the formative reaction subscale (α = .71) to high in the positive give and take space (α = .87). In the present study a general index score was used.

Memphis, Pisa, Paris and San Diego Temperament Assessment Scale (TEMPS-A)

TEMPS-A is the Memphis, Pisa, Paris and San Diego Temperament Assessment Scale (Akiskal et al., 2005). In this investigation a Portuguese version adapted by Figueira and colleagues (2008) was used. It is a self-report questionnaire with 110 items which assesses affective temperaments in five dimensions: cyclothymic, depression, irritability, hyperthermia and anxiety. TEMPS-A subscales attempt to determine emotional, cognitive, psychomotor and circadian traits that can lead to mood disorders (Akiskal et. al, 2005; Figueira et al., 2008). The score attributed was zero (0) for "False" and one (1) for "True" and consequent summation for each subscale. Subjects with scores above the cut-off point of each subscale were considered to have excessive temperament: 13 points for depressive temperament; 16 points for the cyclothymic; 20 for the hyperthymic; 12 for the irritable and 19 for the anxious (Figueira et al., 2008). The validation study for the Portuguese population confirmed the 5 factors and criteria for internal consistency within the acceptable limit (α = .67 to .83) (Figueira et al., 2008). In the present study a general index score was used.

Child Trauma Questionnaire – Short Format (CTQ-SF)

Early complex trauma was assessed with the CTQ-SF (Bernstein et al., 2003, Portuguese version by Dias et al., 2013). The CTQ-SF is a self-report instrument focused on early complex trauma, such as emotional trauma, and physical abuse or maltreatment. It consists of 28 items, classifiable on a 5-point Likert scale, (1 – never occurred to 5 – occurred always), originating from the long version of 70 items developed by Bernstein, Ahluvalia, Pogge and Handelsman (1997). The items that describe childhood experiences are classified according to the frequency with which they occurred: 1 - never, 2 - fewer times, 3 - sometimes, 4 - often or 5 - always, being formulated with experiences of mistreatment or adequate care in childhood. In the present study a general index score was used.

Defensive Styles Questionnaire (DSQ-28)

The defense mechanisms were assessed with the DSQ-28 (Saint-Martin and colleagues, 2013), a reduced version of the Defense Style Questionnaire-40 (Andrews, and colleagues, 1993; adapted to the Portuguese population by Henriques-Calado, 2008), which aims to analyze, through self-assessment, possible knowledge of defense mechanisms. The subjects are asked to assess their degree of agreement with each item, on a 9-point Likert scale, where 1 corresponds to totally disagree, 5 to a totally neutral or indecisive position and 9 to fully agree. The DSQ-28 consists of 28 items that specifically measure attitudes and beliefs that reflect 16 defense mechanisms (mature, neurotic and immature) organized into three global defensive styles. In the study by Saint-Martin and colleagues (2013), the instrument had an internal consistency of .60 for the immaturity factor, .47 for the maturity factor and .42 for the neurotic factor. In the present study a general index score was used.

Young Parenting Inventory (YPI)

Parenting styles were assessed with the YPY (Young, 1994; Portuguese version translated and adapted by Salvador and colleagues, 1996, 2003). The YPI is a self-report instrument for the assessment of schema origins in early childhood and adolescence, based on common behavior of mothers and fathers that are hypothesized to contribute to the development of schemas. It has a response format in a 6-point Likert scale ranging from 1 (does not describe me at all) to 6 (describes me totally). It has two scales for mother and father, each one with 72 items. Higher scores represent the presence of maladaptive parent behaviors. Salvador and colleagues (1996, 2003) documented satisfactory internal consistencies, with Cronbach's alphas between .66 and .89 and between .71 and .90 for the maternal and paternal scales, respectively. In the present study a general index score was used.

Cognitive Fusion Questionnaire (CFQ)

The CFQ (Gillanders et al., 2014; translated and adapted by Gouveia, Dinis, Gregório & Pinto, 2013) consists of 7 items that assess Cognitive Fusion. Each item is rated on a 7-point Likert scale (1 = never true to 7 = always true). Higher scores are suggestive of a greater presence of Cognitive Fusion. Psychometric properties were tested in seven samples ($N = 1880$). It was observed that the instrument presented good evidence of reliability: internal consistency was assessed with Cronbach's alpha coefficient ranged between .88 and .92 and temporal stability measured by test-retest, with an interval of weeks ($r = .80$). The CFQ presented adequate convergent validity with congruent correlations with acceptance, mindfulness, anxiety, depression, and satisfaction with life (Gillanders et al., 2014)

3. *Neuropsychological Procedures and Assessment Battery*

Procedures

Neuropsychological assessments were performed contingently (within a week), after the fulfillment of the self-report instruments along with the EEG session, in a calm and distraction-free room. All assessments were performed in the selected room in the Library of the Faculty of Psychology of University of Lisbon. The completion of all neuropsychological assessments took about one hour and half. The evaluation took about 1 hour and 10 minutes, where performance-based tasks were performed for the neurocognitive functions that were described previously. Neuropsychological tests were counterbalanced to avoid effects and bias in relation to the content used. However, an effort was made to alternate tasks with a cognitive load with less demanding tasks, so as not to saturate the attentional and executive system, with potential damage to neurocognitive efficiency (Lezak et al., 2012). All neuropsychological assessments were performed in a daily time between 9 am and 5 pm.

Wisconsin Card Sorting Test (WCST)

The WCST (Berg, 1948; Grant & Berg, 1948; Heaton et al., 2005) consists of four stimulus cards and 128 response cards, in which there are various shapes (crosses, circles, triangles or stars), colors (green, yellow, blue and red) and numbers (one, two, three or four figures). The task consists in associating each letter of two decks of 64 cards delivered to the subject (color, shape or number), the other stimulus card being displayed on the table. The subject is informed on whether the answer is right or not, without revealing the principle of classification or category. Upon reaching a number of correct

pairs (ten consecutive pairs), the classification principle is changed without prior notice, forcing the subject to use the evaluator's feedback (Heaton et al., 2005). The WCST is scored on eleven performance parameters, namely: *trials administered; correct responses; total errors; perseverative responses; perseverative errors; non-perseverative errors; conceptual level responses; categories completed; trials to complete first category; failure to maintain set* and *other responses*. Raw scores were used in statistical analysis. WCST was administered according to the standards provided in the manual of Heaton and colleagues (2005). The WCST indexes were used to assess cognitive flexibility.

Stroop Task

The Stroop Test (Trenerry et al., 1995, Portuguese adaptation by Castro, et al., 2000), is focused on the assessment of inhibitory control and selective attention. It consists of two tasks, one for reading and the other for naming colors. In both, the stimuli are color names printed in incongruous colors. The word reading task gives an indication of reading fluency and serves to establish a point of comparison for an effective performance in relation to the color naming task. The fact that there is an inconsistency between the word name and the ink color causes an interference effect in the color naming. This interference is the Stroop effect. Tests inspired by the Stroop effect are widely used in neuropsychology to measure executive control and concentration, or to track cognitive dysfunction. In the present study, the correct responses of the Word-Color index were used as a measure of inhibition. Correct responses of the word-canceling task were used as a measure of sustained attention.

Weschler Memory Scale (WMS-III)

The WMS-III is a battery of tests, administered individually, with the objective of evaluating learning, memory and working memory. This scale can be applied to young people and adults, between 16 and 90 years old, and is an important means for the detection and localization of brain dysfunctions. The following subtests are part of this scale: Word Pairs, Family Scenes, Word List, Visual Reproduction, Sequences of Letters and Numbers, Spatial Location, Mental Control and Digit Memory (Wechsler, 2008). Three neurocognitive processes were assessed with the WMS subscales: learning and memory with the Logic Memory Subtest, updating/working memory with the Reversed Digit subtest and divided attention with Sequences of Letters and Numbers subtest.

The Logic memory subtest I and II evaluates episodic and semantic memory through the verbal presentation of 2 stories to the subject. These must be evoked immediately (the second story is read and evoked twice). After an interval of 25 to 30 minutes, the delayed recall test of the two stories is performed, tests which precede a recognition task. Learning Score was obtained with the respective score from the previous task. The recognition process and recall process indexes were also obtained from the previous task.

The Reversed digit subtest consists of repetition in reverse order of series of digits, of increasing size, distributed by items. Each item corresponds to a different string length. The task ends when the subject misses both tests of the same item. The total score of the task is determined by the maximum number of digits repeated correctly. The score ranges from 0 to 14 and higher scores represent higher working memory abilities capacity (Wechsler, 1997, 2008).

The Sequences of Letters and Numbers subtest consists of a repetition of several letters and numbers alternatively. The task ends when the subject misses both tests of the same item. The total score of the task is determined by the maximum number of digits

repeated correctly. The score ranges from 0 to 30 and the higher the score, the better the divided attention (Wechsler, 1997, 2008).

Weschler Adult Intelligence Scale (WAIS-III)

The Wechsler Adult Intelligence Scale (WAIS - III) is a battery of tests used to assess the intelligence of adults, from 16 to 90 years old. It is administered individually and determined by the following subtests: Vocabulary, Similarities, Arithmetic, Digit Memory, Information, Comprehension, Sequence of Letters and Numbers, Complement of Prints, Code, Cubes, Matrices, Print Layout, Symbol Search and Object Composition (Wechsler, 2008). Two neurocognitive processes were assessed with WAIS-III subtests: Speed of processing was assessed with the digit-symbol and abstraction was assessed with the similarities subtest.

The digit-symbol subtest measures the ability to associate numbers with symbols and memorize those associations to perform a task as quickly as possible. It evaluates the "mechanical", automated learning ability. Higher numbers of correct responses represent higher speed of cognitive processing (Wechsler, 2008).

The Similarities subtest examines the ability to establish logical relationships and the formation of verbal concepts or categories. It evaluates the ability to synthesize and integrate knowledge, being a measure of abstraction. The score ranges from 0 to a maximum of 33. Higher scores represent higher abstraction abilities (Wechsler, 2008).

Rey Complex Figure

The Rey-Osterrieth Complex Figure (FCR-O; Osterrieth, 1944; Rey, 1942) was designed to assess problem solving, resources, organizational skills, motor function, perception and memory (Meyers and Meyers, 1995). To reproduce the figure, three sheets

of A4 white paper are required, placed vertically on the table, four pens of different colors which are supplied to the subject one by one, changing during the construction of the figure. The technique of using different pens helps understanding the construction strategy used by the subject, also using a stopwatch and a card with the FCR-O (Espírito Santo, 2013). The time spent on reproducing the copy is counted, however, there is no time limit for the subject to perform this task. Immediate perception was assessed with the copy task and delayed perception was assessed with picture recall.

Verbal Fluency Tasks

Verbal Fluency Tasks are tests of rapid application that assess verbal functioning, and which consist of performing two tasks, semantic fluency, and phonemic fluency (Moura et al., 2013; Simões et al., 2007). In standard versions, participants were asked to list as many words as possible within a semantic category (in the semantic fluency task) or words starting with a certain letter (in the phonemic fluency task) during the 60-second period. The interviewers recorded the words spoken by the participants at 15-second intervals; however, the necessary scores in each time division were not used in the present study, as there was a discrepancy in their collection. Instead, only the number of complete words in the 60 seconds was used. Semantic fluency was assessed with the correct responses score, while semantic errors were assessed with number of errors of the first letter of the semantic task. Phonemic fluency was assessed with the correct responses score, while phonemic errors were assessed with number of errors of the first letter of the phonetic task.

4. Non-Conscious Emotion Priming: Experimental Task and Procedures

Electrophysiological Data Acquisition

EEG and behavioral data acquisition were conducted at the EEG Laboratory of the Faculty of Psychology of the University of Lisbon. Initially, informed consent was reinforced, and subjects were familiarized with the basic characteristics of the task and with the EEG recording and characteristics. Subjects were placed on a chair, and the position was adjusted so that it was 50 cm from the monitor (CRT; 17 inches; spatial resolution - 1024x768; central resolution - 24 bits) where the visual stimuli were presented. A central cross for eye fixation was shown at the beginning of each trial, to reduce eye and muscle artifacts, and to avoid spurious changes in stimulation. All participants were instructed to focus their gaze on the center of the screen during the task and to avoid blinking, contracting the jaw or moving the eyes during the presentation of stimuli. Regularly, in the interval between stimuli, a "Blink now" instruction appeared. A training section of the task was conducted before the execution of the experimental tasks.

The computer software E-Prime 2.0 from Psychology Software Tools Inc. was used to manage all aspects of visual stimuli presentation, randomization of sequences, recording of responses and generation of the trigger signal for the EEG system. The different conditions of subliminal stimulation were defined through the affective valence of subliminal stimuli: positive, negative and neutral conditions. Each subliminal stimulus was backward and forward masked by a visual mask that was specific for each emotion condition (three mask stimuli were used). This matching of mask andemotion condition was balanced between subjects.

The visual stimuli of the three experimental conditions were presented in pseudo-random sequences, with equal probability for each condition, avoiding the repetition of sequences of the same condition, and with a minimum of 70 presentations per condition. The presentations were divided into six blocks with different numbers of essays: 1st block with 10 presentations; 2nd block with 25 presentations; 3rd block with 48 presentations; 4th block with 34 presentations; 5th block with 60 presentations; and the 6th block with 23 presentations. The sequence of presentation of the masks and subliminal stimuli was as follows: mask (164 ms), subliminal stimulus (17 ms), mask (164 ms). Presentation rates were multiples of the monitor's refresh rate. Each of these mask - stimulus - mask sequences constituted an experimental trial. The subliminal stimuli were provided with back-and-forth masking (masking sandwich). The subjects were instructed to perform a task of mental counting of the stimuli (that is, of the mask stimuli) and to indicate this number (using the keyboard) when a slide was presented to request this information – see Figure 1.

Figure 1. Examples of backward and forward masking of positive (left side), negative (center) and neutral (right side) emotional stimuli. The arrows indicate the temporal sequence of presentation of visual stimuli. Presentation times are multiples of the monitor's refresh rate.

The subjects' attention was directed to the masks through the mental counting task. With this procedure, their attention was also assessed: in the interval between blocks of

stimuli, they were asked to indicate, through the computer keyboard, the number of images they saw. During the entire period of performance of this experimental task, the electrophysiological activity of the EEG was continuously recorded.

Behavioural Data Acquisition

Like and dislike responses to an experimental priming condition

A slide was presented at the end of each block of visual stimuli to the subjects with the three mask stimuli (Figure 2), for which they were asked to indicate which mask stimulus they preferred and which they liked the least (choice of pleasure and dislike, respectively), in a forced choice task. They were also asked to indicate, on a Likert scale with five points (1 to 5), the degree to which they preferred the stimulus in comparison to the other two stimuli. The inverse procedure was also carried out for the disliked stimulus. In all cases, response and response time were recorded. At the end of the experiment, after completing the last forced choice, the subjects were asked about what they had seen during the presentations, and if they had visualized anything more than the images they counted. In this way, the degree of visibility of subliminal stimuli was assessed for each subject. All individuals reported not having seen any image presented subliminally, having only considered that the stimulus "blinked", without being able to perceive any figure.

Figure 2. This figure shows the three masks slide in which the subjects should choose (forced choice) which they liked most and its degree; after that, they chose which they disliked and the degree.

EEG Recording

Electrophysiological data was recorded in a laboratory equipped with the EEG *Biosemi ActiveTwo* system with sixty-four active channels. With this number of electrodes, it is possible to access the topography of the electrical activity in the scalp. An electrode assembly of this EEG system includes 10 on the midline of the scalp and 27 locations on each cerebral hemisphere. This system also includes 2 additional electrodes (CMS electrode and DRL electrode) located close to the POz electrode, and 8 outer electrodes (EX1-8) that allow the recording of electrophysiological signals in other parts of the body. The CMS electrode is a reference of the *ActiveTwo* system: the data recorded on the hard disk are the voltage differences between each active electrode and the CMS. The DRL electrode monitors the electrical current between the subject and the analog-to-digital converter (A / D), and the feedback loop that forms with the CMS electrode allows it to act as a substitute for a ground electrode.

The application of the Ag / AgCl electrodes was performed using an elastic lycra cap and an electrolyte gel, according to the international system 10-20 (Jasper, 1958,

Figure 3). The cap was placed according to the instructions of Smith (2009). Vertical eye movements were monitored by the electrode placed below the left eye and by the Fp2 electrode. Horizontal eye movements were monitored using electrodes F7 and F8. In this EEG system, the quality of the electrode-scalp connection is evaluated in the displacement electrode field of the Biosemi ActiView software version 7.06 (www.biosemi.com), which measured the potential of the gel - electrode - scalp interface. This value was, in all registers, low, stable and with values in the range - / + 40 mV. The EEG signals were amplified by the Biosemi ActiveTwo amplifier (DC band 67 Hz; 3dB / octava) and digitized continuously through the A / D converter (24 bits of sampling) at a rate of 512 Hz. A filter of pass banda, high band of 0.16 Hz and low bandwidth of 100 Hz. Continuous EEG of 64 electrodes on the scalp was recorded. The electrophysiological signals were visualized and saved in the ActiView software. This software also proceeded with the online temporal integration of the trigger markers, sent by E-Prime 2.0, synchronized with the mask stimulus onsets and the "Blink now" slides.
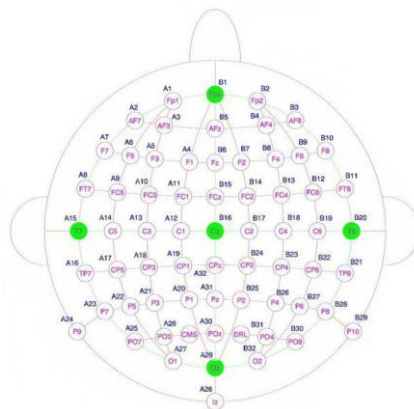
Figure 3. Adaptation of the SI 10 20 for electrode placement.

ERPs Extration

The FieldTrip (Oostenveld and colleagues, 2009), which consists of a toolbox for the MathWorks MATLAB 7.0 computer software, was used to conduct the analysis of the EEG signal and the extraction of ERPs. All procedures followed the appropriate theoretical assumptions (Handy, 2005; Luck & Kappenman, 2012; Picton et al., 2000).

The events and information from the EEG file were extracted. The analysis was focused on the EEG time window defined by the interval of 125 ms before the presentation of the first mask and 1000 ms after. In other words, the time window consisted of the time interval between -125 ms (baseline) and 1000 ms after the start of the first mask.

For the detection of vertical eye movement artifacts, channels Fp1 and EX3 (external electrode used under the left eye) were used, for horizontal eye movements, channels F7 and F8, and for muscle artifacts channels P9 and P10 were used. Visual inspection was conducted, channel by channel, to remove signal artifacts. After the rejection of trials with ocular artifacts, muscles, electrical noise, or others, removing them from the EEG data matrix, an equivalent number of EEG samples was kept for each experimental condition (with the minimum of 20 per condition). This analysis of the EEG signal led to a rejection of 2% of the initial sample, and the initial number of 17 was changed to 15. The signal was re-referenced to the average of all channels. The baseline correction was performed (regression to the mean of the baseline). For each subject, for each channel, and for each experimental condition, the average was computed, and the ERP was extracted. Then, the ERPs grand average (large average of the ERP between subjects) were calculated, only for purposes of visual representation of the differences between conditions.

The ERPs grand average waveforms obtained for each condition were compared for visualization of the differences between the three waveforms, in amplitude and latency. From three large scalp areas (right, left, and midline), inter-comparable grouping areas were performed, respecting the hemispheric symmetry criterion. In the right EEG derivations the following recording regions were considered: right anterior frontal (AF4 and AF8, SI 10-20), right frontal (F4, F6, and F8, SI 10-20), right frontal-temporal (FT8, SI 10-20), right temporal-parietal (T8 and TP8, SI 10-20), right central (C2, C4, and C6, SI 10-20), right center-parietal (CP2 and CP4, SI 10-20), 1st right parietal (P4, SI 10-20), 2nd right parietal (P6, SI 10-20), 3rd right parietal (P10 , IS 10-20), right parieto-occipital (PO8, IS 10-20), and right occipital (O2, IS 10-20). The regions in the left hemisphere were: left frontal anterior (AF3 and AF7, SI 10-20), left frontal (F3, F5, and F7, SI 10-20), left temporal-parietal (T7 and TP7, SI 10-20), left frontal-temporal (FT7 , SI 10-20), left central (C1, C3, and C5, SI 10-20) left central-parietal (CP1 and CP3, SI 10-20), 1st left parietal (P3, SI 10-20), 2nd left parietal (P5, IS 10-20), 3rd left parietal (P9, IS 10-20), left parieto-occipital (PO7, IS 10-20), and left occipital (O1, IS 10-20); anterior frontal midline (AFz, SI 10-20), frontal midline (F1, Fz, and F2, SI 10-20); central midline (Cz, SI 10-20); centro-parietal midline (CPz, SI 10-20); occipital midline (Oz, SI 10-20). The following time windows were used after the beginning of the first mask stimulus: 100 - 150 ms; 350 - 380 ms; 440 - 510 ms. These windows of interest were chosen based on the observation of empirical data and the application of theoretical assumptions.

Mask-Stimuli

Three different mask stimuli were produced from fragments of neutral valence visual stimuli (landscapes) taken from the IAPS. The stimuli of the mask were controlled by parameters of brightness, complexity, and color. They are abstract stimuli, equivalent

to each other for those parameters, and formed by identical fragments of landscapes taken from the IAPS in different positions. These stimuli were also perceptually and aesthetically equivalent, and this equivalence was determined through a preference test. This test was performed before the experiment, in another sample of subjects, in which these mask stimuli obtained identical results in the preference choices. In total, three mask stimuli were created (Figure 1.1), which constituted the target stimuli for the presentation.

Figure 4. Stimuli-created created from fragments of IAPS landscapes.

Subliminal Stimuli

The subliminal stimuli used had well studied emotional value established by normative data of the IAPS database. From this database we have chosen visual stimuli for each one of the three emotion priming conditions: positive, negative and neutral valence. For these, we selected visual stimuli that had an equivalent degree of arousal (for positive and negative conditions; neutral condition had a lower level of arousal), controlling for this affective stimulus variable. These stimuli were selected from the IAPS, having been balanced at the levels of their valence and their arousal. In the normative sample of IAPS, positive stimuli had an average valence value of 6.73, and an average arousal value of 4.64. The negative valence stimuli had an average valence value of 2.66, and an average arousal value of 5.69. The neutral dissipating stimuli had an average valence value of 4.90, and an average arousal value of 1.87. This level of arousal

was lower due to the interaction between arousal and valence (neutral valence has a lower level of arousal than positive and negative emotions). Figure 4 shows examples of IAPS stimuli with different emotional valence, which consist of different photographs of the same individual, with positive, negative and neutral facial expressions. Figure 5 is only an example because contents were varied and counterbalanced between conditions. The contents of the visual images varied from social groups to interactions of two persons, and individual expressions and situations.

Figure 5. Examples of subliminal stimuli: emotional stimulus of positive value (left side); negative emotional stimulus (center); emotionally neutral stimulus (right side).

5. *Statistical Analysis*

The present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used to explore sociodemographic description, using frequencies, percentages, averages, standard deviations, and confidence intervals. All multicollinearity values were shown to be adequate |VIF < 2; T < 7|, normal distribution was assumed (N > 30) and a 95% confidence interval was assumed with a *p*-value of .05 (Pallant, 2007). To explore the association between constructs, Pearson correlations were used. To explore path analysis and mediation models, the macro process for SPSS (Hayes, 2013) was used. Repeated measures ANOVA was used to test the statistical significance of the results obtained in the three experimental conditions. ANOVA was calculated on

the mean amplitude values for the subsets of channels grouped by the registration areas and in the time windows defined in the previous point, with the experimental condition as an intra-subject factor. All statistical analyses were performed in IBM SPSS Statistics version 25.

PART THREE: EMPIRICAL STUDIES

Study 1 - Psychometric validation of several assessment measures in the

Portuguese Population with independent samples

Metacognitive Self-assessment Scale: Psychometric properties and clinical implications

Published in the Journal of Applied Neuropsychology: Adult (2019)

Faustino, B., Vasco, A. B., Oliveira, J., Lopes, P., & Fonseca, I

ABSTRACT

Metacognition is a higher-order psychological construct that has been conceptualized as the ability to identify and describe mental states, beliefs, and intentions of self and others. The Metacognition Self-Assessment Scale (MSAS), was developed to assess different functions of metacognition, being a potential asset in fields such as psychotherapy and clinical neuropsychology. However, a reliability and validity study is still lacking, as well, the study with other related metacognitive constructs. This research describes the psychometric analysis of the MSAS in a cross-sectional design and the study of the relationship between metacognitive functions, meta-beliefs, and cognitive fusion. The sample comprised 194 participants from the general population (76% women), with an average age of 32 years old. Exploratory factor analysis, Cronbach alpha, test-retest, and validity procedures through bivariate correlations with convergent/divergent measures were conducted. The scale showed satisfactory psychometric properties with good internal consistency along with appropriate convergent/divergent validity. Metacognition and cognitive fusion were negatively correlated, while negative meta-beliefs and mastery predicted the variance of cognitive fusion. Decentering-differentiation factors correlated negatively with cognitive fusion and personal discomfort. These results suggest that MSAS may be a reliable tool to assess metacognition in the Portuguese population. Clinical implications are discussed.

Self-assessment of patterns of subjective experience: development and psychometric properties of the state of mind questionnaire

Published in the Journal of Research in Psychotherapy, Process, and Outcome (2021)

Faustino, B., Vasco. A. B., Dimaggio, G., Silva. A. N, & Seromenho, S

ABSTRACT

States of mind are forms of subjective experience that involve cognitions, emotions, needs, desires, and physical sensations, subjectively, some charged with suffering some positive. This study presents a questionnaire for the evaluation of states of mind: The States of Mind Questionnaire (SMQ). We first review the literature leading to the development of SMQ and then we investigate its psychometric properties. We conducted an Exploratory Factor Analysis (EFA), internal reliability, inter-correlations between subscales, test-retest reliability, and convergent, divergent, and discriminant validity. Finally, we explored the relationship between mental states and symptoms. The sample was composed of 427 individuals divided into two groups with different symptoms levels. EFA showed a coherent structure. Internal consistency was good for 24 subscales (Cronbach's α of .62 to .96) and test-retest reliability was adequate. States of mind converged and diverged with schemas, discriminated among the two subgroups, and predicted symptomatology. Overall results indicate that SMQ may be a valuable tool for assessing states of mind.

Emotional Processing Difficulties Scale - revisited: Preliminary psychometric study

Faustino, B., Vasco. A. B., Silva. A. N, & Barreira, J

ABSTRACT

Emotional Processing Difficulties are a core construct from Emotion-Focused Therapy and a clinical target for clarified psychotherapeutic tasks. The identification of these emotional difficulties is largely based on observation and clinical judgment. In a previous work, Barreira and Branco Vasco (2016) developed the Emotional Processing Difficulties Scale, for research purposes. However, due to some limitations in item comprehension, we performed a content analysis and a psychometric study of the scale. This study describes the first psychometric analysis of the Emotional Processing Difficulties Scale-Revised (EPDS-R). In a sample of 260 participants, Exploratory Factor Analysis (EFA), reliability, and validity procedures were conducted. EPDS-R matched adequate criteria in EFA (KMO=.89; Bartlett's sphericity test $p < 0.00001$), suggesting a five-dimensional structure. Cronbach alfas ranged from .87 to .70. Convergent evidence was found between EPDS-R and difficulties in emotional regulation (DERS) and discriminant evidence was found in two sub-samples based on > 1.7 clinical criteria from the Brief Symptom Index (BSI). According to this primary psychometric study, EPDS-R may be a valid tool to assess emotional processing difficulties in the general population

Factor Structure and Convergent Validity of the Portuguese version of the

Inventory of Interpersonal Problems – 32

Published in the Journal of Relationships Research (2020)

Faustino, B., & Vasco. A. B.,

ABSTRACT

The Inventory of Interpersonal Problems (IIP-32) is one of the most used measures to explore individuals' interpersonal styles. However, an IIP-32 Portuguese version is missing. Therefore, this study describes a preliminary psychometric study of an IIP-32 Portuguese version in a non-clinical sample. In a cross-sectional correlational design, 250 (M=20.67, SD=4.88, Male=33, Female=217), participants were assessed with self-report questionnaires. Exploratory factor analysis (EFA) and convergent and divergent of IIP-32 was tested with the Interpersonal Reactivity Index (IRI). Relationships with symptomatology were also tested with the Inventory of Psychopathological Symptoms (BSI-53). EFA showed a theoretically coherent eight-factor structure. Almost of IIP-32 subscales were correlated with personal discomfort and IIP-32 with symptomatic domains of BSI-53. Promising preliminary psychometric properties were found, which may support IIP-32 as a reliable instrument to assess interpersonal styles. However, more research is required to deepen the analysis of the IIP-32 in the Portuguese population.

Development and Preliminary Analysis of the Clinical Decision-Making Inventory

Faustino, B., & Vasco. A. B.,

Abstract

Understanding clint´s variables relevant to clinical decision making is a core feature in psychotherapy. The previous meta-analysis emphasized variables related to stages of psychotherapy, motivational stages of change, alliance, reactance, coping, attachment styles, and emotional stability in psychotherapy outcome. However, a clinical measure that captures these empirically based clinical variances is missing. The present study describes the development and preliminary analysis of the Clinical Decision-Making Inventory (CDMI), in a clinical sample. One hundred and twenty-three participants (M=20.28, SD=5.80),), engaged in a psychotherapy process, were assessed in a cross-sectional design. Results showed that, on one hand, stages of psychotherapy, motivational stages of change, reactance, coping, attachment styles, and emotional stability were negatively correlated with symptomatology, cognitive fusion, interpersonal problems, coping mechanisms, and expressive suppression. On the other hand, correlated positively with metacognition, and cognitive reappraisal. Attachment style and emotional stability predicted symptomatology. The Clinical Decision-Making Inventory showed promising results, however, more research is required to deepen the psychometric analysis.

Study 2 - Structural equation modeling of complex relationships between personality domains and mental processes

Structural equation modeling of complex relationships between personality domains and mental processes

Abstract

Focused on the previous theorization this study aimed to explore the complex relationships between core hypothesized theories underlying psychological disorders. Complex sequential meditations of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains were explored. Several complex mediations were conducted to explore relationships between schematic functioning and defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains. Sequential mediation modeling showed that Early Complex Trauma predicted difficulties in the regulation of psychological needs, with significant contributions from temperament and parenting styles. Also, early maladaptive schemas preceded emotional and interpersonal schemas, with this relationship being moderated by complex states of mind. In another path analysis within these variables, metacognition and mentalization and psychological inflexibility moderated the schema path analysis. Further, significant mediation models were found between defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains on the relationships between schematic functioning and psychological needs. However, the relationship between schematic functioning and symptomatology had less significant mediations within the same variables. Implications for these results are discussed.

Introduction

The exploration of early and/or previous determinants of psychological disorders is a hallmark of every major theoretical orientation and a cornerstone in the model under study. As theorized before, complex interactions between genes and environment shape individuals' psychological and neurobiological functioning with differential impacts on multidimensional areas of case conceptualization. Therefore, this second study of the present doctoral proposal is focused on the exploration of several complex sequential meditations of early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains. Here I will briefly summarize the empirical findings that support hypothesis development, data analysis, and discussion.

Early Disorder Determinants

Early or previous disorder determinants, as defined in the first part of the present doctoral proposal, *are all significant variables or factors that have a major role in the development and maintenance of last-longing emotional suffering, cognitive-perceptual impairment, and interpersonal behavior dysregulation* – see table 1. These variables are theorized as the core determinants of chronic and pervasive psychological disorders (Cozolino, 2017; Dimaggio et al., 2015; Faustino, 2020; Young, et al., 2003). In the present work, the identified variables were early childhood trauma (early toxic environment), affective temperament, parenting styles, and the dysregulation of psychological needs.

The relationship between early childhood trauma and psychological disorders is well established in the literature (AAP, 1995). Several meta-analyses showed robustly that early childhood trauma is associated with psychotic symptoms (Kelleher et al., 2013), physical, emotional, sexual abuse and physical neglect with suicidal attempts (Zatti et al., 2017), depression (Humphreys et al., 2020), and reoffending (Dalsklev et al., 2019). Moreover, childhood trauma has been associated with poor neurocognition and psychosis (Popovic et al., 2019), and dissociation (Vonderlin et al., 2018). Thus, Sudbrack and colleagues (2015) document that early complex trauma is associated with different temperamental traits, where mean scores on the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003) were negatively correlated with adaptive traits (volition, control, coping, and stability), and positively correlated with non-adaptive traits (sensitivity, anger, anxiety). Despite being a cross-sectional study, it gives a helpful insight into the relationship between early complex trauma and temperamental traits.

Parenting styles were also associated with temperamental traits and early childhood trauma. Different parenting styles have differential implications for psychological functioning. Authoritarian and permissive styles were associated with low self-regulation (Madeline, 2017), whereas adaptive/authoritative parenting style is associated with adaptive levels of self-regulation (Eisenberg, 2005). Furthermore, dysfunctional parenting styles are associated with early maladaptive schemas (Esmali Kooraneh & Amirsardari, 2015), depression (Gibb et al., 2003; McLeod et al., 2007), maladaptive coping modes in eating behaviors (Brown et al., 2016), lower levels of self-regulation (LeCuyer & Swanson, 2017), inadequate social-emotional development (Shaffer &K Kipp, 2013) and maladaptive personality development (Baumrind, 1991; Basso et al., 2019).

Research has supported the view that the regulation of psychological needs is a core determinant of mental health (Faustino & Vasco, 2020a,b,c; Sol & Vasco, 2017; Vasco et al., 2018). Individuals who score higher in the NSRS-43 have higher levels of psychological well-being and life satisfaction and lower levels of psychological distress (Barreira, 2016; Castelo Branco, 2016; Martins, 2016; Sol & Vasco, 2017). Thus, research systematically shows that the regulation of psychological needs is negatively correlated with early maladaptive schemas (Faustino & Vasco, 2020a,b,c), emotional schemas (Faustino et al., 2020a), and symptomatology (Sol & Vasco, 2017; Vasco et al., 2018). Thus, the regulation of psychological needs, in theory, is a core structural variable in the development of personality, and the learning of how to regulate them begins early. However, relationships between the regulation of psychological needs and early disorder determinates are still unexplored empirically.

Furthermore, despite these insightful empirical findings, some links are still missing. The weight of affective temperament and parenting styles on schema formation is not clear, nor how these impact the regulation of psychological needs, within an SEM approach.

Maladaptive Schemas and States of Mind

Maladaptive core schemas have been defined *as dysfunctional mental structures, with several mental elements (e.g., rigid beliefs and expectations, dysfunctional self-images, autobiographic memories, non-adaptive effects), which encapsulate the pervasive meanings and learnings reflected on past dysfunctional experiences that are the foundational blocks of the vulnerable, weak, fragile or depleted self*. Maladaptive core schemas tend to cluster thematically and are the core of chronic and last-longing disorders with emotional suffering, cognitive-perceptual impairment, and interpersonal behavior

dysregulation (Faustino, 2021b). States of mind are the moment-to-moment emotional states that reflect the activation of several crystallized schemas all together, based on an internal or external trigger. The present work focuses on the concepts of early maladaptive schemas (Young et al., 2003), emotional schemas (Lehay, 2010), interpersonal schemas (Dimaggio et al., 2015), and states of mind (Horowitz, 2000).

Early maladaptive schemas (Young, Klosko, and Weishaar, 2003) have been associated not only with difficulties in the regulation of psychological needs, cognitive fusion, and emotional processing difficulties (Faustino & Vasco, 2020a,b,c) but also with depression (Renner et al. 2012), anxiety (Hawke & Provencher 2011), interpersonal problems (Janovsky, et al., 2019; Thimm, 2013), emotional dysregulation (Dadomo et al.) and personality disorders (Lobbestael et al. 2008). However, empirical exploration of the relationship between early maladaptive schemas and emotional and interpersonal schemas is lacking.

Emotional schemas (Leahy, 2002) have also been associated with difficulties in the regulation of psychological needs (Faustino et al., 2020a) and difficulties in emotion regulation strategies (Faustino, 2021a). A mediation model showed that individuals who had higher levels of emotional schemas used more frequently expressive suppression, which facilitated the emergence of symptomatology (Faustino, 2021a). Moreover, emotional schemas have been associated with depression, anxiety, trauma, alexithymia, and difficulties in the socialization of emotions (Lehay, 2011; Lehay et al., 2018; Edwards, et al., 2016; Edwards & Wupperman, 2018; Palmeira et al., 2011).

Interpersonal schemas have been studied mostly with indirect measures (e.g., IIP-32, YSQ-S3), due to the lack of a construct congruent definition. Thus, this is one major reason that motivates the present study, that is, to explore the associations between different types of schemas, and to understand how similar or different they are. Moreover,

maladaptive interpersonal schemas are associated with borderline personality disorder (Cohen et al., 2016), psychological symptoms and parenting styles (Soygüt &Cakir, 2009), traumatic childhood and interpersonal styles (Tezel et al., 2015), interpersonal trauma (Karatzias, Jowett, Begley, & Deas, 2016) and interpersonal problems (Janovsky et al., 2019; Thim, 2013).

States of mind (Horowitz, 1989) were associated with early maladaptive schemas and symptomatology through a new self-assessment instrument called the States of Mind Questionnaire (Faustino et al., 2020b). In this study, vulnerable and coping self-states were all positively correlated with early maladaptive schemas and symptomatology, whereas adaptive self-states showed the inverse pattern. However, it is not clear if states of mind are also associated with emotional or interpersonal schemas.

Defensive Maneuvers and Critical Consequences

As defined previously, defensive maneuvers and critical consequences consist of all the *implicit/automatic and/or explicit/deliberate maintenance processes and/or consequences that individuals engage to avoid, suppress, distort, or confront in dealing with emotional suffering or stressful situations/contexts based on internal or external appraisals. These processes are responsible for schema maintenance because they do not allow individuals to engage in cognitive, emotional, and relational corrective experiences, as they are afraid of being hurt or damaged, as they were before*.

Defensive styles and coping strategies, from an integrative perspective, may be viewed as all the internal and external actions that individuals do to avoid, suppress, overcompensate or transform emotional suffering that stems from the activation of maladaptive schemas or states of mind (Dimaggio et al., 2015; Young, et al., 2003). They may be viewed as automatic and deliberate process to deal with dysfunctional affect and

emotional suffering (Cramer, 1998). Defensive styles have been associated with coping strategies (Saint-Martin et al., 2013), early maladaptive schemas (Walburg & Chiaramello, 2015), anxiety and depression (Kennedy et al., 2001). Congruent with this, coping strategies have also been associated with early maladaptive schemas, depression and anxiety (Camara & Calvete, 2012). However, it not clear what mediation role these two *defensive maneuvers* have regarding maladaptive schematic functioning and the regulation of psychological needs.

Dysfunctional interpersonal cycles (Saffran and Murran, 2000) seem to have pervasive impacts on several structural variables under study, as they can be viewed as interpersonal pervasive relational processes. They have been associated with early maladaptive schemas and cognitive fusion (Faustino & Vasco, 2020a), defensive styles (Martins, 2016), and the regulation of psychological needs (Faustino & Vasco, 2020a; Martins, 2016). Also, they seem to contribute to depressive symptomatology, low self-esteem, and relational difficulties (Benjamin, 2013, 2018). However, it is not clear how they relate to emotional or interpersonal schemas.

From the perspective of the EFT model (Elliott et al., 2004), emotion processing difficulties stem from *emotion schemes,* which is a similar concept to the notion of schemas. Research showed that the relationship between emotion processing difficulties and psychological needs is mediated by early maladaptive schemas (Faustino & Vasco, 2020c) and in a hierarchical regression model, they both predicted symptomatology. Also, positive medium to strong correlations between all schema domains (e., disconnection and rejection) and four emotional processing difficulties (e.g., problematic reaction self-interruption split) were documented previously (Faustino et al., 2019b). Emotion processing difficulties were associated with psychiatric symptoms and alexithymia (Baker et al., 2011), alexithymia (Saariaho et al., 2015), and the regulations of

psychological needs in a nonclinical and clinical sample (Barreira, 2016; Castelo-Branco, 2016). However, it is not clear if emotional processing difficulties are associated with emotional and interpersonal schemas or even states of mind.

Mental Skills and Processes

Mental Skills and Processes are the *structural and functional low-level and higher-order mental processes that research has shown to be highly significant to mental processing and affective regulation* – see table1.

Metacognition and mentalization are intrinsically connected because the former represents the mental domains and the associated processes and the latter represents the ability to assimilate and accommodate mental elements by these processes within metacognitive domains (Faustino et al., 2020a). The relationships between metacognitive domains and processes should be flexible, to allow the individual to better adapt to environmental demands. Research showed that metacognitive deficits are associated with psychological inflexibility (Faustino et al., 2019a), whereby individuals who had higher levels of cognitive fusion showed lower levels of metacognitive abilities. Those individuals also showed higher levels of dysfunctional meta-beliefs. Moreover, metacognitive deficits have been found in emotional disorders (Wells, 2000), maladaptive coping modes and psychological needs (Gonçalves, 2020), difficulties in affect regulation (Harder & Folke, 2012), poor social functioning (Bo et al., 2015), personality disorders (Dimaggio et al., 2015), schizophrenia (Dimaggio & Lysaker, 2010), learning disabilities (Lucangeli et al., 1998) and autism spectrum disorders (Grainger et al., 2014).

As described before, psychological inflexibility is central in mental health (Kashdan & Rottenberg, 2010), and a core variable in the present work. It has been associated with psychological distress (Bardeen and Fergus, 2016; Krafft et al., 2019), symptomatology (Gillanders et al., 2014), impairment of emotional differentiation

(Plonsker et al., 2017), emotion dysregulation domains (Faustino, 2020) and early maladaptive schemas (Faustino & Vasco, 2020b). Thus, Faustino, and Vasco (2020b) reported that cognitive fusion was a significant mediator of the relationship between early maladaptive schemas and the regulation of psychological needs. However, it is not clear how psychological inflexibility relates to other schemas.

Cognitive reappraisal and expressive suppression are two major emotion regulation strategies that individuals use to deal with emotional experience (Gross, 2010). Previous research suggested that the use of different regulatory strategies depends on dispositional and situational factors, such as the need to suppress anger at work (Booth et al., 2017) and psychological inflexibility (Faustino, 2020). Thus, these strategies may be associated with maladaptive schemas. Faustino and Vasco (2021) described on the one hand, that emotional schemas mediate the relationship between expressive suppression and symptomatology. On the other hand, the relationship between cognitive reappraisal was not mediated by any emotional schema. Moreover, it is not clear if these two important regulatory strategies are significant mediators of the relationship between schematic functioning and psychological needs.

Adaptive self-domains

Adaptive self-domains consist of all the *healthy personality domains that are developed to counterbalance maladaptive schemas and/or traits. They encapsulate the adaptive schematic functioning that results of the adaptive meaning-making that stemmed from satisfactory early and later emotional and relational experiences* – see table 1. The development of an adaptive self may be viewed as one of the most pursued goals in psychotherapy (Dimaggio et al., 2015; Lobbestael et al., 2008, 2010; Young et al., 2003). These dimensions tend to be manifested as dimensions of secure attachment (Young et

al., 2003), acceptance (Hayes et al., 1999), and self-compassion (Gilbert, 2010). Previous research supports this assumption, as adult attachment insecurity (anxiety or avoidance) is negatively correlated with mindfulness and all of its sub-dimensions, such as acting with awareness, observing, describing, non-reacting, and non-judging (Stevenson et a., 2017). Self-acceptance has been positively associated with mental health, and higher levels of life satisfaction and negatively associated with anxiety and depression symptomatology and low self-esteem (Chamberlain & Haaga, 2001). Moreover, self-compassion was found to be negatively associated with emotional schemas (Faustino et al., 2020a), depression, anxiety, self-criticism, and negative affectivity (Neff et al., 2005). Macbeth and Gumley (2012) reported in a meta-analytic study several negative associations between self-compassion and psychopathology, especially with anxiety and depressive symptoms (Costa & Pinto-Gouveia, 2011) and distress symptomatology (Birnie et al., 2010; Raque-Bogdan et al., 2011). Faustino and collaborators (2021b) developed the states of mind questionnaire that has an adaptive self-domain which encompasses four complex states, attachment/belonging, self-confidence/coherence, acceptance/mindfulness, and compassion/emotional fulfillment, which are theorized as the core adaptive self-states. Research showed that these states were negatively correlated with all early maladaptive schemas and the adaptive self-domain was the best predictor of symptomatology in a non-clinical sample. These are promising results; however, more research is required to explore associations between these adaptive states and other psychological constructs.

Table 1. Brief description of the personality core domains under study.

	Personality Core Determinants and Domains
Early Disorder Determinants *Early Complex Trauma* *Affective Temperament*	All significant variables or factors that have a major role in the development and/or maintenance of last-longing emotional suffering, cognitive-perceptual self-impairment, interpersonal

Parenting Styles *Psychological Needs* *Symptomatology*	behavior dysregulation, and systematic non-adaptation. These factors have pervasive impacts on schema formation and in the development of defensive maneuvers. These variables may also be described as antecedent factors.
Maladaptive Schemas and States of Mind *Early Maladaptive Schemas* *Emotional Schemas* *Interpersonal Schemas* *States of Mind*	Dysfunctional mental structures, with several mental elements (e.g., rigid beliefs and expectations, dysfunctional self-images, autobiographic memories, non-adaptive emotions), that encapsulate the pervasive meanings and learnings reflected on past dysfunctional experiences that are the foundational blocks of the vulnerable, weak, fragile or depleted self.
Defenses and Critical Consequences *Defensive Styles* *Coping Strategies* *Dysfunctional Interpersonal Cycles* *Emotion Processing Difficulties*	Maintenance implicit/automatic and/or explicit/deliberate processes and/or consequences that individuals engage to avoid, suppress, distort, or confront to deal with emotional suffering or stressful situations/contexts based on internal or external appraisals. These processes are responsible for schema maintenance.
Mental Skills and Processes *Metacognition and Mentalization* *Psychological inflexibility* *Cognitive Reappraisal* *Experiential Suppression*	Structural and functional low-level and higher-order mental processes that research showed to be highly significant to mental processing and affective regulation. These processes may be theoretically related to neurocognitive processes, such as executive functions, complex attention, autobiographical memory, and self-perception.
Adaptative Self Domains *Attachment/Belonging* *Self-Confidence/Coherence* *Acceptance/Mindfulness* *Compassion/Emotional Fulfilment*	Healthy personality domains that are developed to counterbalance maladaptive schemas and/or traits. Encapsulates the adaptive schematic functioning that results from the adaptive meaning-making that steamed from satisfactory early and later emotional and relational experiences.

Research Issues and Hypotheses

Based on previous theorizations, some research issues can be raised. Each research domain (e.g., early disorder determinants, defenses and critical consequences) works as five independent theories/domains that will be divided into five major research questions, subdivided into a different hypothesis. The research questions and hypotheses are described below:

Research question 1:

Hypothesis 1a: Early disorder determinants are positively correlated with early maladaptive schemas, emotional schemas, and interpersonal schemas

Hypothesis 1b: Maladaptive schemas and states are positively correlated with defensive maneuvers and dysfunctional consequences

Hypothesis 1c: Maladaptive schemas and states are correlated with mental skills and processes

Hypothesis 1d: Maladaptive schemas and states are negatively correlated with adaptive self-domains

Research question 2:

Hypothesis 2a: Temperamental styles, parenting styles, and psychological needs mediate the relationship between early complex trauma and early maladaptive schemas

Hypothesis 2b: Emotional schemas, interpersonal schemas, and states of mind mediate the relationship between early maladaptive schemas and symptomatology

Hypothesis 2c: Emotional schemas, interpersonal schemas, and states of mind mediate the relationship between early maladaptive schemas and symptomatology, with metacognition and psychological inflexibility as covariates

Research question 3:

Hypothesis 3a: Defensive Styles, coping strategies, dysfunctional cycles, and emotion processing difficulties mediate the relationships of early maladaptive schemas, emotional schemas and interpersonal schemas with psychological needs

Hypothesis 3b: Defensive Styles, coping strategies, dysfunctional cycles, and emotion processing difficulties mediate the relationships of early maladaptive schemas, emotional schemas and interpersonal schemas with symptomatology.

Research question 4:

Hypothesis 4a: Metacognition and mentalization, psychological inflexibility, expressive suppression, and cognitive reappraisal mediate the relationships of early maladaptive schemas, emotional schemas, and interpersonal schemas with psychological needs

Hypothesis 4b: Metacognition and mentalization, psychological inflexibility, expressive suppression, and cognitive reappraisal mediate the relationships of early maladaptive schemas, emotional schemas, and interpersonal schemas with symptomatology

Research question 5:

Hypothesis 5a: Adaptative states of mind (healthy self), mindfulness and acceptance, trust and coherence, self-compassion, and emotional attachment mediate the relationships of early maladaptive schemas, emotional schemas, and interpersonal schemas with psychological needs

hypothesis 5b: Adaptive states of mind (healthy self), mindfulness and acceptance, trust and coherence, self-compassion, and emotional attachment mediate the relationships of early maladaptive schemas, emotional schemas, and interpersonal schemas with symptomatology

Methods

Participants

The sample consisted of 644 participants, 100 males (15.5%) and 544 females (84.5%), with an age range between 18 and 63 years old (M=20.68, SD=5.53). Age of education frequencies were 577 (89.6%) with the 12th year, 45 (7.0%) with a bachelor's degree, 20 (3.1%) with a master's degree, and 2 (.3%) with a doctoral degree. Most of the sample was Portuguese, 609 (93.5%), and some were Brazilian, 32 (3.9%). The frequencies and percentages distribution of the sample regarding the marital status is as follows: 614 (95.3%) were single, 19 (3.0%) were married, 7 (1.1%) were in a nonmarital partnership and 4 (.4%) were divorced. One hundred and twenty-three individuals (19.1%) were engaged in psychotherapy with several self-reported diagnoses, being generalized anxiety disorder (n=11, 2.2%), major depression (n=8, 1.6%), and depression with anxiety (n=7, 1.4%) the most prevalent – see table 2 for details.

Table 2. Descriptive statistics of the sample under study

		Frequencies and percentages
N		644 (100%)
Age		
	M	20.68
	SD	5.53
	Minimum	18
	Maximum	63
Gender		
	Male	100 (15.5%)
	Female	544 (84.5%)
Nationality		
	Portuguese	609 (93.5%)
	Brazilian	32 (3.9%)
	Mozambican	6 (1.1%)
	Cabo-Verdean	2 (.4%)
	Other	6 (1.1%)

Scholarship

	12th year	577 (89.6%)
	Bachelor's degree	45 (7.0%)
	Master's degree	20 (3.1%)
	Doctoral degree	2 (.3%)

Marital Status

	Single	614 (95.3%)
	Married	19 (3.0%)
	Nonmartial partnership	7 (1.1%)
	Divorced	4 (.4%)

Psychotherapy

	Yes	123 (19.1%)
	No	521 (80.9%)

Self-reported diagnosis

	Generalized Anxiety Disorder	11 (2.2%)
	Major Depression	8 (1.6%)
	Depression and Anxiety	7 (1.4%)
	Panic Disorder	4 (.8%)
	Social Anxiety	1 (.2%)
	Anorexia Nervosa	3 (.6%)
	Co-morbid personality disorders	4 (.8%)
	Unspecified	8 (1.6%).

Self-Report Instruments

In this study, self-report questionnaires and neuropsychological instruments were used. To see specific details of the instruments, see the previous section – *methodology* - of the present doctoral proposal. Internal consistency and instrument scores are detailed in table 3. Based on previous theorizations, several self-report questionnaires were used to assess *early disorder determinants*. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of

Memphis, Pisa, Paris and San Diego-autoquestionnaire version (TEMPS-A, Akiskal et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et al., 2012) was used. Finally, to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess *maladaptive schematic functioning and states of mind.* To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Lehay Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020d) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

To assess *defensive maneuvers and critical consequences,* different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28 (DSQ, Saint-Martin et al., 2013, revised Portuguese version by Martins, 2016) was used. To assess coping strategies, the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth & Pokorny 1999, revised Portuguese version by Martins, 2016) was used. Finally, to assess emotional

processing difficulties, the Emotional Processing Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, in press) was used.

Mental skills and processes were assessed with different self-report measures. Metacognition and mentalization were assessed with a combined score from the Metacognitive Self-Assessment Scale (MSAS, Pedone et al., 2017, Portuguese version by Faustino et al., 2019a). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório & Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009), was used. Finally, to assess **_adaptive self-states,_** the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020 and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality assured. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. A bonification was given to each participant who completed the entire battery. The inclusion criteria were: being over 18 and below 65 years old; speaking Portuguese for more than 5 years; and not having a neurocognitive disorder.

This present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used for sample exploration. Brown (2006) skewness values should vary between −3 and +3 and kurtosis values between −10 to +10

are adequate when utilizing Structural Equations Models (SEM). Skewness and kurtosis were acceptable and a 95% confidence interval was assumed with a *p*-value of .05 (Pallant, 2007). To explore the association between constructs, Pearson correlations were used. To explore path analysis and mediation models, the macro process for SPSS (Hayes, 2013) was used. To perform the path and mediation analysis, the Power analysis was calculated with MedPower software (Kenny, 2017). To indirect effects, a statistical power of 1.00 ($b = .09$, $p < .05$) was found with actual sample size (*N*=644), which is excellent. Confidence intervals of 95% and a 10,000 number of bootstrap computations were used in the all path and mediations. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

Descriptive statistics are presented in table 3.

Table 3. Descriptive statistics of the variables under study.

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.91	2.10	.71	1.25	3.39	.58	-1.37
Affective Temperament (TEMPS-A)	.80	1.38	.17	0.00	1.79	-.59	6.36
Parenting Styles (YPI)	.93	2.38	.44	1.40	4.03	.68	.37
Psychological Needs (NSRS-43)	.90	5.58	.89	2.88	7.40	-.50	-.14
Symptomatology (BSI-53)	.96	1.08	.67	0.00	3.28	.76	.03
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.52	.68	1.00	4.70	.48	-.11
Emotional Schemas (LSS-50)	.88	3.02	.54	1.47	4.86	.38	-.23
Interpersonal Schemas (IIP-32)	.87	1.38	.45	0.41	2.69	.36	-.45
States of Mind (SMQ)	.94	2.61	.69	1.06	4.63	.45	-.27
Defenses and Critical Consequences							
Defensive Styles (DSQ-29)	.65	4.39	.73	2.43	6.68	.05	-.28
Coping Strategies (Coping index of SMQ)	.90	3.01	.81	1.17	5.13	.27	-.39

Dysfunctional Interpersonal Cycles (IRPQ)	.83	2.88	.29	1.97	3.79	-.23	.58
Emotion Processing Difficulties (EPDS-R)	.90	2.54	.61	1.18	4.68	.10	-.14
Mental Skills and Processes							
Metacognition (MSAS)	.72	4.14	.35	2.98	4.95	-.37	-.03
Psychological inflexibility (CFQ)	.92	3.7128	1.44	1.00	7.00	1.60	-.717
Cognitive Reappraisal (ERQ)	.78	4.63	1.14	1.33	7.00	-.40	-.05
Experiential Suppression (ERQ)	.75	4.03	1.16	1.00	7.00	-.17	-.32
Adaptative Self Domains							
Attachment/Belonging (SMQ)	.72	4.09	.67	2.00	5.75	-.36	-.27
Self-Confidence/Coherence (SMQ)	.69	3.96	.67	1.50	6.00	-.46	.33
Acceptance/Mindfulness (SMQ)	.68	3.25	.73	1.00	5.75	.22	-.04
Compassion/Emotional Fulfilment (SMQ)	.69	3.51	.85	1.00	5.75	-.25	-.32

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale;; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Correlational Analysis

A correlational analysis was conducted to test the first cluster of hypotheses (1a, 1b, 1c, 1d). Pearson correlations were used to explore the associations between early disorder determinants and early maladaptive schemas, emotional schemas, and interpersonal schemas (hypothesis 1a). Overall, statistically significant correlations with the expected directions were found. Early complex trauma correlated positively with early maladaptive schemas ($r = .13$, $p. < .01$) and ($r = .08$, $p < .01$) and states of mind, but did not correlate with emotional and interpersonal schemas. Affective temperament was positively correlated with early maladaptive schemas ($r = .51$, $p < .01$), emotional schemas ($r = .46$, $p < .01$), Interpersonal schemas ($r = .44$, $p. < .01$) and states of mind ($r = .48$, $p < .01$). Parenting styles followed the same correlational pattern as affective temperament ($p < .01$). Psychological needs was negatively correlated with early maladaptive schemas ($r = -.67$, $p < .01$), emotional schemas ($r = -.45$, $p < .01$), interpersonal schemas ($r = -.58$,

p <.01) and states of mind (*r* = -.67, *p* <.01). Therefore, this hypothesis was partially confirmed – see table.

Table 4. Pearson correlations between early disorder determinants with maladaptive schematic functioning and states of mind (N=644).

	Early Maladaptive Schemas	Emotional Schemas	Interpersonal Schemas	States of Mind
Early Complex Trauma	.13**	.07	.07	.08*
Affective Temperament	.51**	.46**	.44**	.48**
Parenting Styles Total	.37**	.32**	.36**	.37**
Psychological Needs	-.67**	-.45**	-.58**	-.67**
Symptomatology	.73**	.58**	.59**	.77**

*Note: *p.<05; **p.<01.*

To test if the maladaptive schematic functioning and states of mind were positively correlated with defensive maneuvers and dysfunctional consequences (hypothesis 1b), Pearson correlations were used. Statistically significant correlations were found according to the expected associations. Early maladaptive schemas were positively correlated with defensive styles (*r* = .33, *p* <.01), coping mechanisms (*r* = .80, *p* <.01), relational cycles (*r* = .16, *p*. <.01) and emotional processing difficulties (*r* = .74, *p*. <.01). Emotional and interpersonal schema followed the same correlational pattern (*p* <.01). States of mind were also positively correlated with defensive styles (*r* = .33, *p* <.01), coping mechanisms (*r* = .95, *p* <.01), relational cycles (*r* =. 16, *p*. <.01) and emotional processing difficulties (*r* = .75, *p*. <.01). Therefore, this hypothesis was confirmed – see table 5.

Table 5. Pearson correlations between maladaptive schematic functioning and states of mind with defensive maneuvers and dysfunctional consequences (N=644).

	Defensive Styles	Coping Mechanisms	Relational Cycles	Emotional Processing Difficulties

Early Maladaptive Schemas	.33**	.80**	.16**	.74**
Emotional Schemas	.38**	.61**	.22**	.63**
Interpersonal Schemas	.27**	.62**	.17**	.62**
States of Mind	.33**	.95**	.16**	.75**

Note: *p.<05; **p.<01.

Pearson correlations were used to test if the maladaptive schematic functioning and states are correlated with mental skills and processes (hypothesis 1c). All correlations were statistically significant and followed theoretical predictions. On the one hand, early maladaptive schemas were negatively correlated with metacognition ($r = -.28$, $p <.01$) and cognitive reappraisal ($r = -.19$, $p <.01$); on the other hand, early maladaptive schemas were positively correlated with psychological inflexibility a ($r = .70$, $p <.01$), and expressive suppression ($r = .30$, $p <.01$). Emotional and interpersonal schemas followed the same correlational pattern ($p <.01$). States of mind were also negatively correlated with metacognition ($r = -.25$, $p<.01$) and cognitive reappraisal ($r = -.19$, $p <.01$); on the other hand, they were positively correlated with psychological inflexibility a ($r = .71$, $p <.01$) and expressive suppression ($r = .23$, $p <.01$). Therefore, this hypothesis was confirmed – see table 6.

Table 6. Pearson correlations between maladaptive schematic functioning and states of mind with mental skills and processes (N=644).

	Metacognition	Psychological Inflexibility	Cognitive Reappraisal	Suppression
Early Maladaptive Schemas	-.28**	.70**	-.19**	.30**
Emotional Schemas	-.26**	.61**	-.03	.26**
Interpersonal Schemas	-.32**	.57**	-.20**	.18**
States of Mind	-.25**	.71**	-.19**	.23**

Note: *p.<05; **p.<01.

To explore if maladaptive schematic functioning and states of mind are negatively correlated with adaptive self-domains (hypothesis 1d), Pearson correlations were used. All statistically significant correlations were in the expected direction. Early maladaptive schemas were negatively correlated with attachment/belonging ($r = -.55$, $p <.01$), self-confidence/coherence ($r = -.51$, $p <.01$), acceptance/mindfulness ($r = -.22$, $p. <.01$) and compassion/emotional fulfillment ($r = -.55$, $p. <.01$). Emotional and interpersonal schemas followed the same correlational pattern ($p <.01$). Also, states of mind were negatively correlated with attachment/belonging ($r = -.64$, $p <.01$), self-confidence/coherence ($r = -.60$, $p <.01$), acceptance/mindfulness ($r = -.39$, $p. <.01$) and compassion/emotional fulfilment ($r = -.68$, $p. <.01$). Therefore, this hypothesis was confirmed – see table 7.

Table 7. Pearson correlations between maladaptive schematic functioning and states of mind with adaptive self-domains N=644).

	Attachment and Belonging	Self-Confidence and Coherence	Acceptance and Mindfulness	Compassion and Emotional Fulfilment
Early Maladaptive Schemas	-.55**	-.51**	-.22**	-.55**
Emotional Schemas	-.42**	-.47**	-.17**	-.42**
Interpersonal Schemas	-.47**	-.39**	-.11**	-.44**
States of Mind	-.64**	-.60**	-.39**	-.68**

Note: *p.<05; **p.<01.

Path Analysis – Sequential mediation

The second cluster of hypotheses (2a, 2b, 2c) were explored with path analysis. Path analysis was computed with PROCESS macro in SPSS, Model 6 with 10000 bootstrap samples, and a 95% confidence interval (Hayes, 2013). According to Baron and Kenny (1986), three steps are required to explore data conditions to path analysis. Step 1: the predictor variables need to be both associated with the outcome variable; step 2: both

predictor variables need to be associated with the hypothesized mediating variables; step 3: the mediating variables need to be both associated with outcome, controlling for the predictor variables. However, early complex trauma (predictor) was not associated with parenting styles (mediator) - ($r = .012$, $p. >01$). Nevertheless, the model was tested due to theoretical coherence. The results are as follows.

A sequential path model hypothesized that early complex trauma impacts on psychological needs may be mediated by several other variables, such as affective temperament, parenting styles, and early maladaptive schemas (hypothesis 2a).
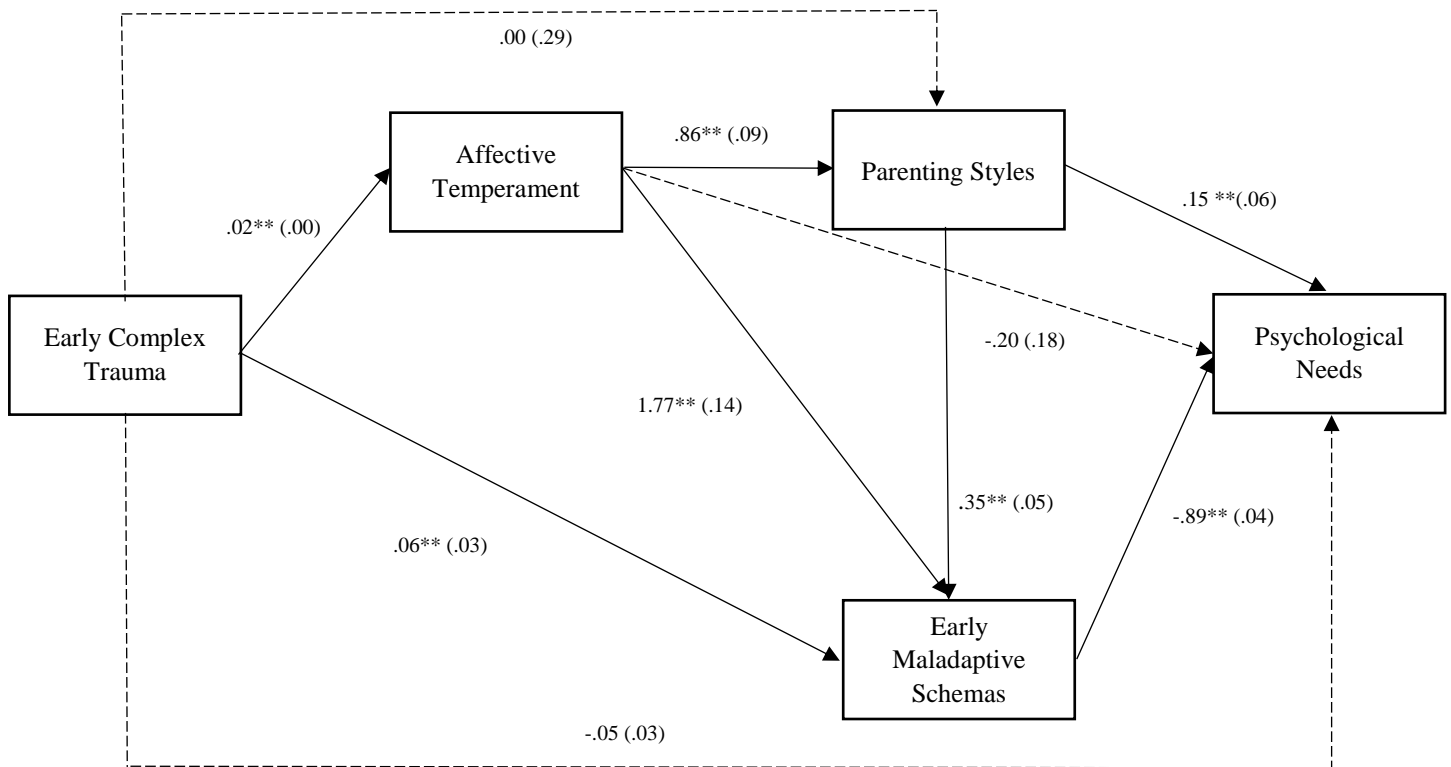
Figure 1. Best representative model of the sequential path model with early complex trauma impacts on psychological needs mediated by affective temperament, parenting styles, and early maladaptive schemas.

Significant direct path effects on equation regressions were found between early complex trauma and affective temperament ($b = .02$, |-.04 to -.01|, $p <.01$) and early maladaptive schemas ($b = .06$, |-.12 to -.01|, $p <.01$). Significant indirect path effects on

equation regressions were found between early complex trauma and parenting styles ($b =$ .01, |-.01 to -.01|, p <.01), early maladaptive schemas ($b = .03$, |.01 to .06|, p <.01) and psychological needs ($b = .01$, |.01 to .01|, p <.01).

The main total effect of the hypothetical indirect path between early complex trauma and psychological needs was significant ($b = -.05$, |.04 to -.01|, p >.01), and was mediated by affective temperament ($b = .02$, |-.04 to -.01|, p <.01), parenting styles ($b = .86$, |.67 to 1.06|, p <.01), early maladaptive schemas ($b = .35$, |.25 to .46|, p <.01) to psychological needs ($b = -.89$, |-.89 to -.80|, p <.01). Therefore, this hypothesis was confirmed – see figure 1.
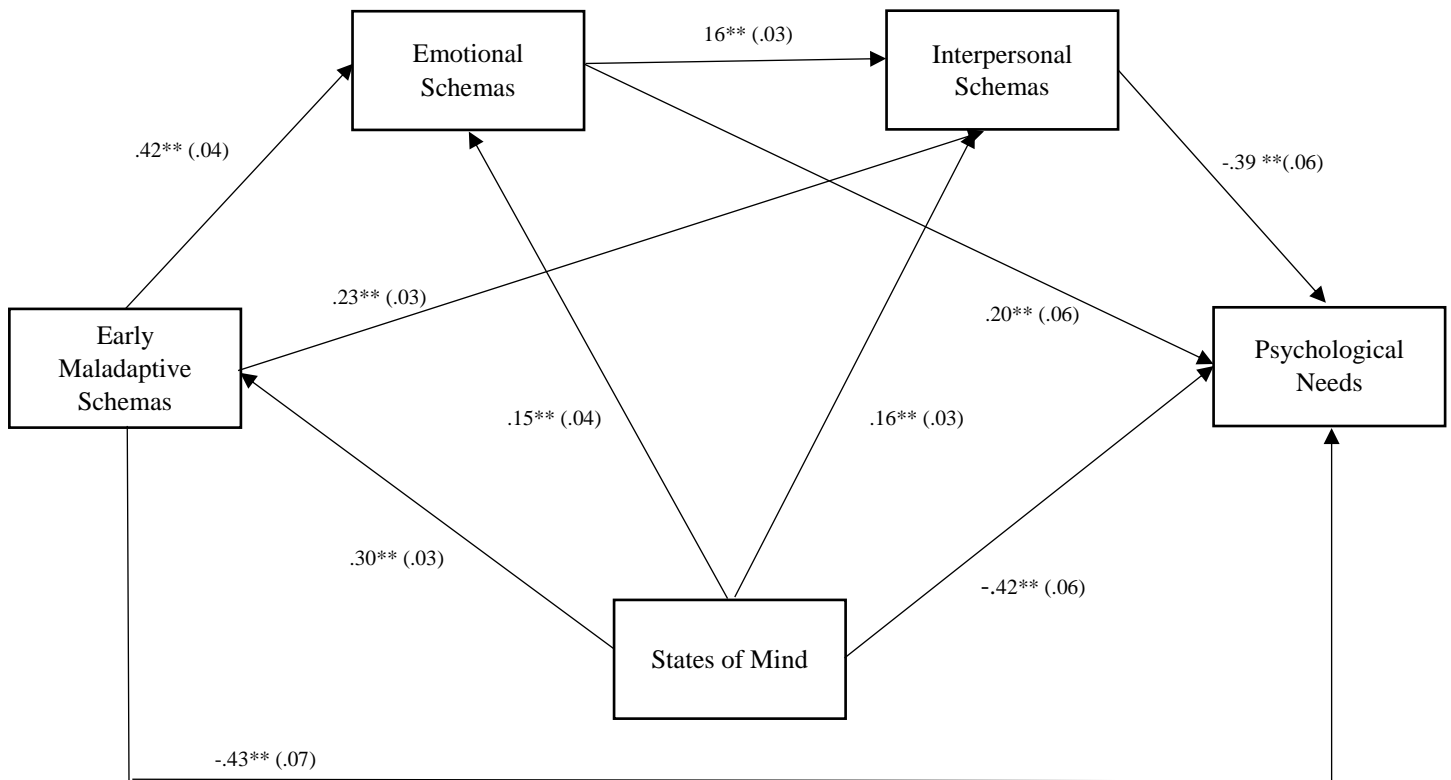
Figure 2. Best representative model of the mediational analysis of the relationship between early maladaptive schemas and psychological needs emotinal schemas, and interpersonal schemas as mediators ($b = -.43$, p. <.05).

A sequential path model hypothesized that emotional schemas and interpersonal schemas mediate the relationship between early maladaptive schemas and symptomatology and states of mind is a significant covariate (hypothesis 2b). Significant

direct path effects on regression equations were found between early maladaptive schemas and emotional schemas (b = .42, |.34 to .50|, p <.01), interpersonal schemas (b = .23, |.11 to .30|, p <.01) and psychological needs (b = -.43, |-.58 to -.29|, p <.01). States of mind regressed statistically significantly with emotional schemas (b = .15, |.07 to .23|, p <.01), interpersonal schemas (b = .16, |.09 to .22|, p <.01) and psychological needs (b = -.43, |-.56 to -.29|, p <.01). Significant indirect path effects on equation regressions were found between early maladaptive schemas (b = .42, |1.43 to 1.66|, p <.01), emotional schemas (b = .16, |.09 to .26|, p <.01), interpersonal schemas (b = -.39, |-.54 to -.23|, p <.01) and psychological needs (b = -.23, |-.04 to -.01|, p <.01) – full indirect effect. Therefore, this hypothesis was confirmed – see figure 2.

A sequential path model hypothesized that emotional schemas and interpersonal schemas and states of mind mediate the relationship between early maladaptive schemas and symptomatology, with metacognition and psychological inflexibility as covariates (hypothesis 2c). Similar to the previous model, significant direct path effects on equation regressions were found between early maladaptive schemas, emotional schemas, interpersonal schemas, and psychological needs (b = -.01, |-.02 to .01|, p <.01). Significant direct path effects on equation regressions were found between early maladaptive schemas and emotional schemas (b = .42, |.35 to .48|, p <.01), interpersonal schemas (b = .30, |.24 to .36|, p <.01), states of mind (b = .58, |.51 to .65|, p <.01), and psychological needs (b = -.30, |-.43 to -.16|, p <.01).

Metacognition regressed statistically significantly with emotional schemas (b = -.10, |-.18 to -.01|, p <.01), interpersonal schemas (b = -.15, |-.22 to -.08|, p <.01), and psychological needs (b = .64, |.51 to .77|, p <.01), but not with states of mind. Psychological inflexibility regressed statistically significant with emotional schemas (b = .08, |.05 to .10|, p <.01), interpersonal schemas (b = .03, |.01 to .05|, p <.01), states of

mind ($b = .10$, |.07 to .12|, $p <.01$) and psychological needs ($b = -.20$, |-.24 to -.15|, $p <.01$).

Significant indirect path effects on equation regressions were found between early

maladaptive schemas ($b = .42$, |.35 to .48|, $p <.01$), emotional schemas ($b = .15$, |.08 to

.21|, $p <.01$), interpersonal schemas ($b = .18$, |.10 to .27|, $p <.01$), states of mind ($b = -.28$,

|-.41 to -.16|, $p <.01$) and psychological needs ($b = -.01$, |-.01 to -.01|, $p <.01$) – full indirect

effect. Therefore, this hypothesis was partially confirmed – see figure 3.
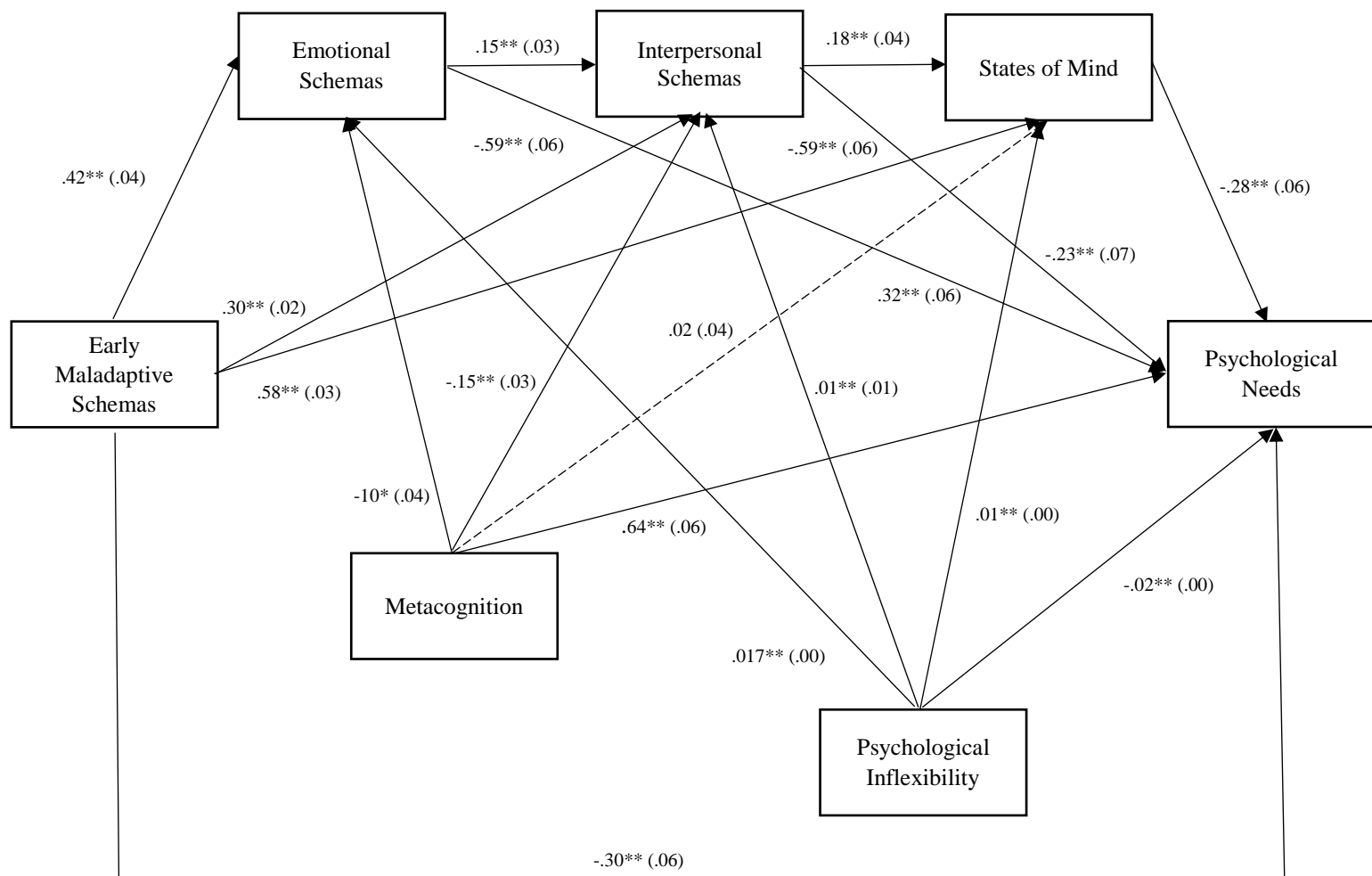
Figure 3. Best representative model of path analysis between early maladaptive schemas and psychological needs with emotional schemas, interpersonal schemas , and states of mind as mediators (b = -.30, p. <.05).

Mediation Analysis

The third (3a, 3b), fourth (4a, 4b), and fifth (51, 5b) cluster of hypotheses were explored with several mediation models. Mediation analyses were performed with PROCESS macro in SPSS, Model 4 with 10000 bootstrap samples, and a 95% confidence interval (Hayes, 2013). Direct effects are displayed in figures and indirect effects are detailed in the text. Arrows only represent the full model between early maladaptive schemas and psychological needs.

To test if defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties mediate the relationship between early maladaptive schemas, emotional schemas, and interpersonal schemas with psychological needs a complex mediation model was used (hypothesis 3a). Figure 2 represents the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors and defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties as mediators.

A first significant mediation model emerged with 4 significant mediators for the relationship between early maladaptive schemas and psychological needs (b = -.28, |-.37 to -.19|, p <.01). In this sense, defensive styles (b = .07, |.04 to .10|, p <.01), coping strategies (b = -.15, |-.23 to -.07|, p <.01), relational cycles (b = .01, |.01 to .02|, p <.01), and emotion processing difficulties (b = -.22, |-.29 to -.15|, p <.01) emerged as significant mediators of the relationship between early maladaptive schemas and psychological needs.

A second significant mediation model emerged with 4 significant mediators for the relationship between emotional schemas and psychological needs (b = -.63, |-.72 to -.52|, p <.01). Therefore, defensive styles (b = .14, |-.72 to -.52|, p <.01)., coping strategies (b = -.38, |-.48 to -.29|, p <.01), relational cycles (b = .03, |.01 to .06|, p <.01), and emotion

processing difficulties ($b = -.41$, |-.52 to -.32|, $p < .01$) emerged as significant mediators of the relationship between emotional schemas and psychological needs.
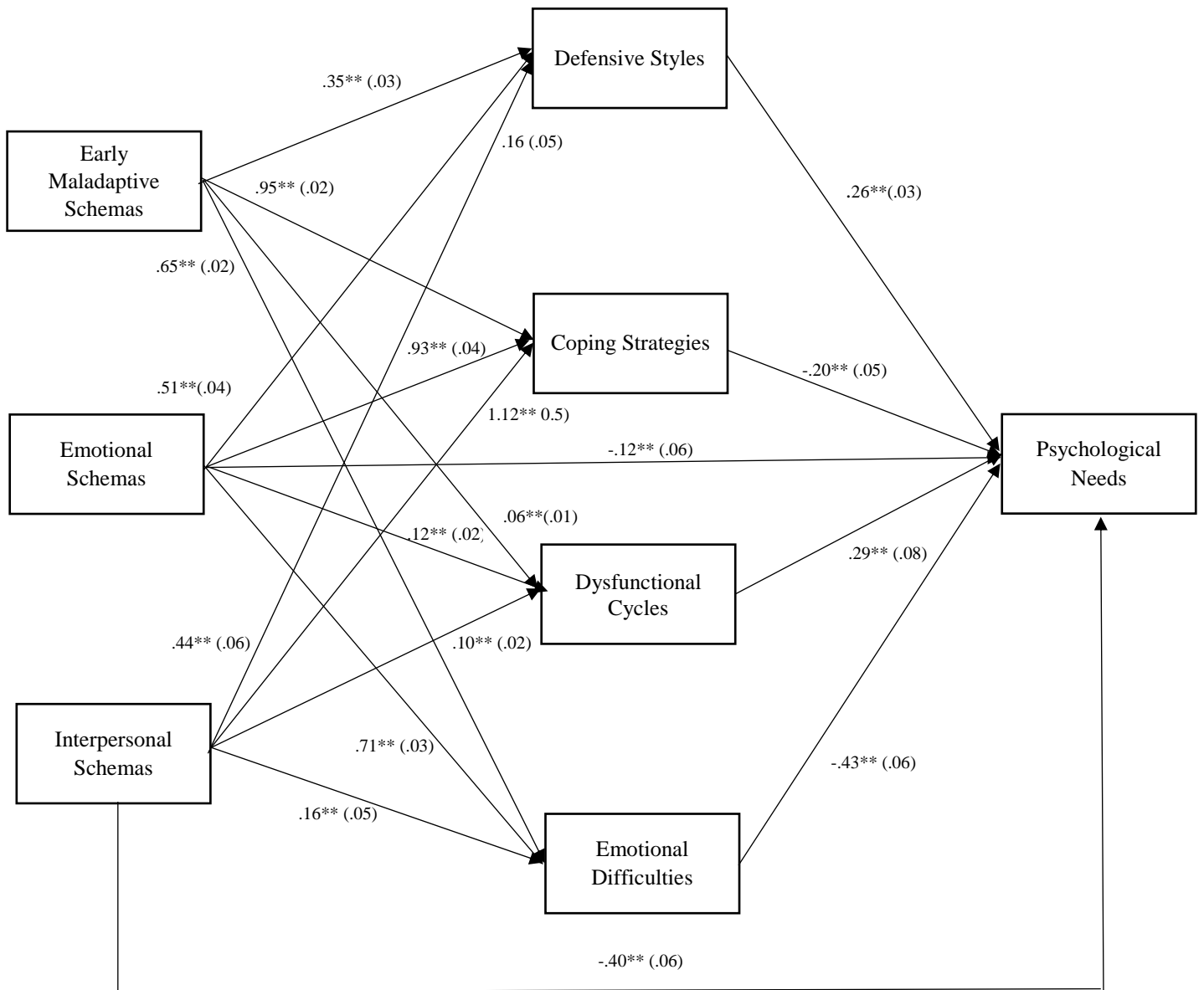
Figure 4. Best representative model of the mediational analysis of the relationship between maladaptive schematic functioning and psychological needs with if defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties as mediators.

A third significant mediation model emerged with 4 significant mediators for the relationship between interpersonal schemas with psychological needs ($b = -.63$, |-.75 to -.51|, $p < .01$). In this sense, defensive styles ($b = .11$, |.74 to .60|, $p < .01$), coping strategies ($b = -.37$, |-.48 to -.26|, $p < .01$), relational cycles ($b = .03$, |.01 to .06|, $p < .01$), and emotion

processing difficulties (b = -.41, |-.53 to -.29|, p <.01) emerged as significant mediators of the relationship between interpersonal schemas and psychological needs. Therefore, this hypothesis was confirmed – see figure 4.

To test if defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties mediate the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and symptomatology, a complex mediation model was used (hypothesis 3b). Table 8 describes the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors (3 predictors) and defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties as mediators (4 mediators).

The relationship between early maladaptive schemas and symptomatology was mediated by coping strategies (b = .03, |.23 to .37|, p <.01) and emotion processing difficulties (b = .18, |.12 to .24|, p <.01), but not by defensive styles and relational cycles. However, even though only two mediators emerged as statistically significant, the full model indirect effect was significant (b = .48, |.40 to .55|, p <.01). The relationship between emotional schemas and symptomatology was mediated by coping strategies (b = .36, |.29 to .43|, p <.01) and emotion processing difficulties (b = .22, |.15 to .29|, p <.01), but not by defensive styles and relational cycles. Only two mediators had emerged as statistically significant, but the full model indirect effect was significant (b = .58, |.50 to .66|, p <.01). Finally, the relationship between interpersonal schemas and symptomatology was mediated by coping strategies (b = .43, |.35 to .52|, p <.01) and emotion processing difficulties (b = .26 = |.18 to .34|, p <.01), but not by defensive styles and relational cycles. Only two mediators emerged as statistically significant, but the full model indirect effect was significant (b = .69, |.60 to .79|, p <.01). Therefore, this hypothesis was partially conformed – see table 8.

Table 8. Mediation analysis of the relationship between maladaptive schematic functioning and symptomatology with defensive styles, coping strategies, relational cycles, and emotion processing difficulties as mediators (N = 646).

	Beta	SE	Indirect Effect	Boot SE	Lower-Limit	Upper-Limit	Sig
Early Maladaptive Schemas	.23	.04	.48	.03	.40	.55	.00
Defensive Styles	.01	.02	.01	.01	-.01	.01	.99
Coping Strategies	.32	.03	.30	.03	.23	.37	.00
Relational Cycles	-.02	.05	-.01	.00	-.01	.01	.66
Emotion Processing Difficulties	.27	.04	.18	.03	.12	.24	.00
Emotional Schemas	.15	.04	.58	.04	.53	.66	.00
Defensive Styles	-.01	.02	-.01	.01	-03	02	.63
Coping Strategies	.39	.03	.36	.03	29	.43	.00
Relational Cycles	-.04	.05	-.01	.01	-.02	.01	42
Emotion Processing Difficulties	.31	.04	.22	.03	.15	.29	.00
Interpersonal Schemas	.18	.4	.69	.04	.60	.79	.00
Defensive Styles	.01	.02	.01	.01	-.02	.02	.93
Coping Strategies	.38	.03	.43	.04	.35	.52	.00
Relational Cycles	-.03	.05	-.01	.01	-.01	.01	.54
Emotion Processing Difficulties	.31	.04	.26	.04	.18	.24	.00

Note. ∗∗ p < .001

To test if metacognition, psychological inflexibility, expressive suppression, and cognitive reappraisal mediate the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and psychological needs, a complex mediation model was used (hypothesis 4a). Figure 5 represents the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors and metacognition, psychological inflexibility, expressive suppression, and cognitive reappraisal as mediators.

A first significant mediation model emerged with 4 significant mediators for the relationship between early maladaptive schemas with psychological needs ($b = -.46$, |-.55 to -.38|, $p < .01$). In this sense, metacognition ($b = -.07$, |-.10 to -.04|, $p < .01$), psychological inflexibility ($b = -.30$, |-.37 to -.23|, $p < .01$), expressive suppression ($b = -.02$, |-.05 to -

.01|, $p <.01$) and cognitive reappraisal (b = -.06, |-.09 to -.03|, $p <.01$) emerged as significant mediators of the relationship between early maladaptive schemas and psychological needs.
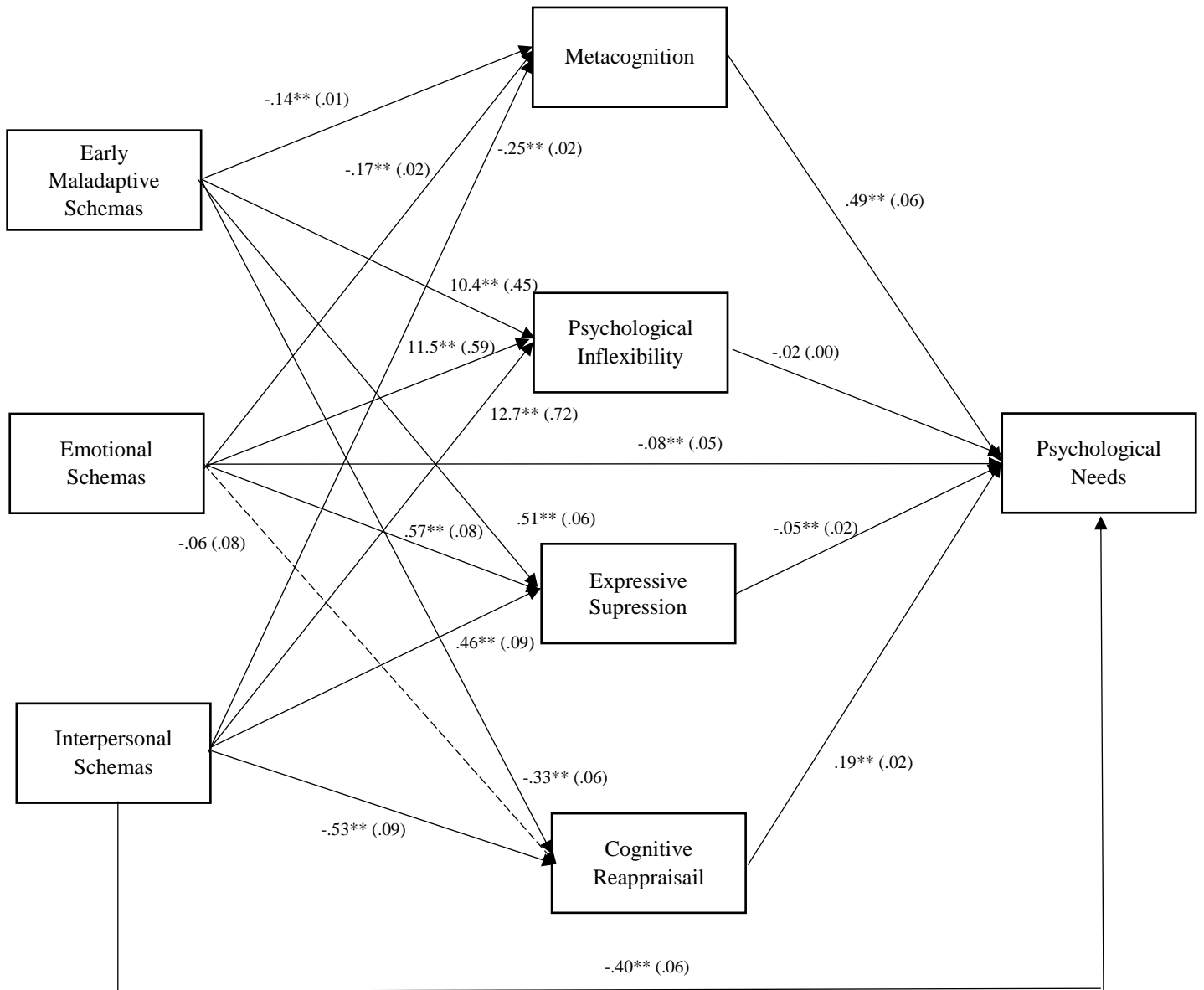
Figure 5. Best representative model of the mediation analysis of the relationship between maladaptive schematic functioning and psychological needs with metacognition and mentalization, psychological inflexibility, expressive suppression, and cognitive reappraisal as mediators.

A second significant mediation model did not reveal significant effects for the 4 hypothesized mediators (b = -.67, |-.77 to .57|, $p >.01$) of the relationship between early

maladaptive schemas and psychological needs. Metacognition (b = -.09, |-.13 to -.05|, p <.01), psychological inflexibility (b = -.50, |-.58 to -.42|, p <.01), and expressive suppression (b = -.05, |-.09 to -.03|, p <.01) emerged as the three significant mediators of the relationship between emotional schemas and psychological needs. Cognitive reappraisal was not a significant mediator of the relationship between early maladaptive schemas and psychological needs.

A third significant mediation model emerged with 4 significant mediators for the relationship between interpersonal schemas and psychological needs (b = -.74, |-.85 to -.63|, p <.01). In this sense, metacognition and mentalization (b = -.11, |-.16 to -.07|, p <.01), psychological inflexibility (b = -.47, |-.56 to -.38|, p <.01), expressive suppression (b = -.04, CI= |-.07 to -.02|, p <.01) and cognitive reappraisal (b = -.10, |-.16 to -.06|, p <.01) emerged as significant mediators of the relationship between interpersonal schemas and psychological needs. Therefore, this hypothesis was confirmed – see figure 5.

To test if metacognition, psychological inflexibility, expressive suppression and cognitive reappraisal mediate the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and symptomatology, a complex mediation model was used (hypothesis 4b). Figure 5 represents the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors (3 predictors) and metacognition, psychological inflexibility, expressive suppression, and cognitive reappraisal as mediators(4 mediators).

The relationship between early maladaptive schemas and symptomatology was mediated by psychological inflexibility (b = .16, |.15 to .25|, p <.01) and expressive suppression (b = -.02, |-.04 to -.01|, p <.01), but not by metacognition and cognitive reappraisal. However, even though only two mediators emerged as statistically significant, the full model indirect effect was significant (b = .18, |.12 to .24|, p <.01). The

relationship between emotional schemas and symptomatology was only mediated by psychological inflexibility ($b = .35$, |.28 to .42|, $p <.01$), but not by metacognition and mentalization, expressive suppression and cognitive reappraisal. However, even though only one mediator emerged as statistically significant, the full model indirect effect was significant ($b = .36$, CI= |.29 to .43|, $p <.01$). Finally, the relationship between interpersonal schemas and symptomatology was only mediated by psychological inflexibility ($b = .41$, |.34 to .49|, $p <.01$), but not by metacognition and mentalization, expressive suppression and cognitive reappraisal. However, even though only one mediator emerged as statistically significant, the full model indirect effect was significant ($b = .43$, CI= |.35 to .52|, $p <.01$). Therefore, this hypothesis was partially confirmed – see table 9.

Table 9. Mediation analysis of the relationship between maladaptive schematic functioning and symptomatology with metacognition, psychological inflexibility, expressive suppression, and cognitive reappraisal as mediators (N = 644).

	Beta	SE	Indirect Effect	Boot SE	Lower-Limit	Upper-Limit	Sig
Early Maladaptive Schemas	.53	.03	.18	.03	.12	.24	.00
Metacognition	-.02	.05	.01	.01	-.01	.02	.60
Psychological Inflexibility	.16	.01	.20	.02	.15	.25	.00
Expressive Suppression	-.02	.01	-.02	-.01	-.04	-.01	.00
Cognitive Reappraisal	-.01	.01	.01	.01	-.01	.01	.34
Emotional Schemas	.37	.04	.36	.03	.29	.43	.00
Metacognition	-.03	.05	.01	.01	-.01	.02	.59
Psychological Inflexibility	.21	.01	.35	.03	.28	.42	.00
Expressive Suppression	-.01	.01	-.01	.01	-.02	.01	.77
Cognitive Reappraisal	-.06	.01	.01	.01	-.01	.01	.00
Interpersonal Schemas	.44	.05	.43	.04	.35	.52	.00
Metacognition	-.01	.05	.01	.01	-.02	.03	.88
Psychological Inflexibility	.22	.01	.41	.03	.34	.49	.00
Expressive Suppression	.01	.01	.01	.01	-.01	.01	.91
Cognitive Reappraisal	-.03	.01	.01	.01	-.01	.03	.08

To test if adaptative states of mind (healthy self), mindfulness/acceptance, self-confidence/coherence, self-compassion/emotional fulfillment and attachment/belonging mediate the relationships between early maladaptive schemas, emotional schemas and interpersonal schemas and psychological needs, a complex model was tested (hypothesis 5a). Figure 6 represents the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors of mindfulness/acceptance, self-confidence/coherence, self-compassion/emotional fulfillment, and attachment/belonging as mediators.

The first mediation model was not significant for the 4 hypothesized mediators (b = -.04, |-.12 to .04|, p >.01). However, mindfulness/acceptance (b = .02, |.05 to .15|, p <.01) and self-confidence/coherence (b = .10, |.05 to .15|, p <.01) and self-compassion/emotional fulfillment (b = -.16, |-.22 to -.10|, p <.01) emerged as significant mediators of the relationship between early maladaptive schemas and psychological needs (3 significant mediators).

The second mediation model was significant (b = -.29, |-.37 to -.20|, p <.01), but only for 3 hypothesized mediators. Mindfulness/acceptance (b = .02, |.05 to .05|, p <.01), self-compassion/emotional fulfillment (b = -.26, |-.33 to -.20|, p <.01) and attachment/belonging (b = -.10, |-.16 to -.05, p <.01) emerged as significant mediators of the relationship between emotional schemas and psychological needs (3 significant mediators). Self-confidence/coherence was not a significant mediator in this model.

The third model was significant (b = -.27, |-.38 to -.18|, p <.01), but only for 2 hypothesized mediators for the relationship between emotional schemas and psychological needs. Self-compassion/emotional fulfillment (b = -.27, |-.36 to -.20|, p <.01) and attachment/belonging (b = -.06, |-.13 to -.01, p <.01) emerged as significant mediators of the relationship between interpersonal schemas and psychological needs,

while mindfulness/acceptance and self-confidence/coherence did not. Therefore, this

hypothesis was partially conformed – see figure 6.
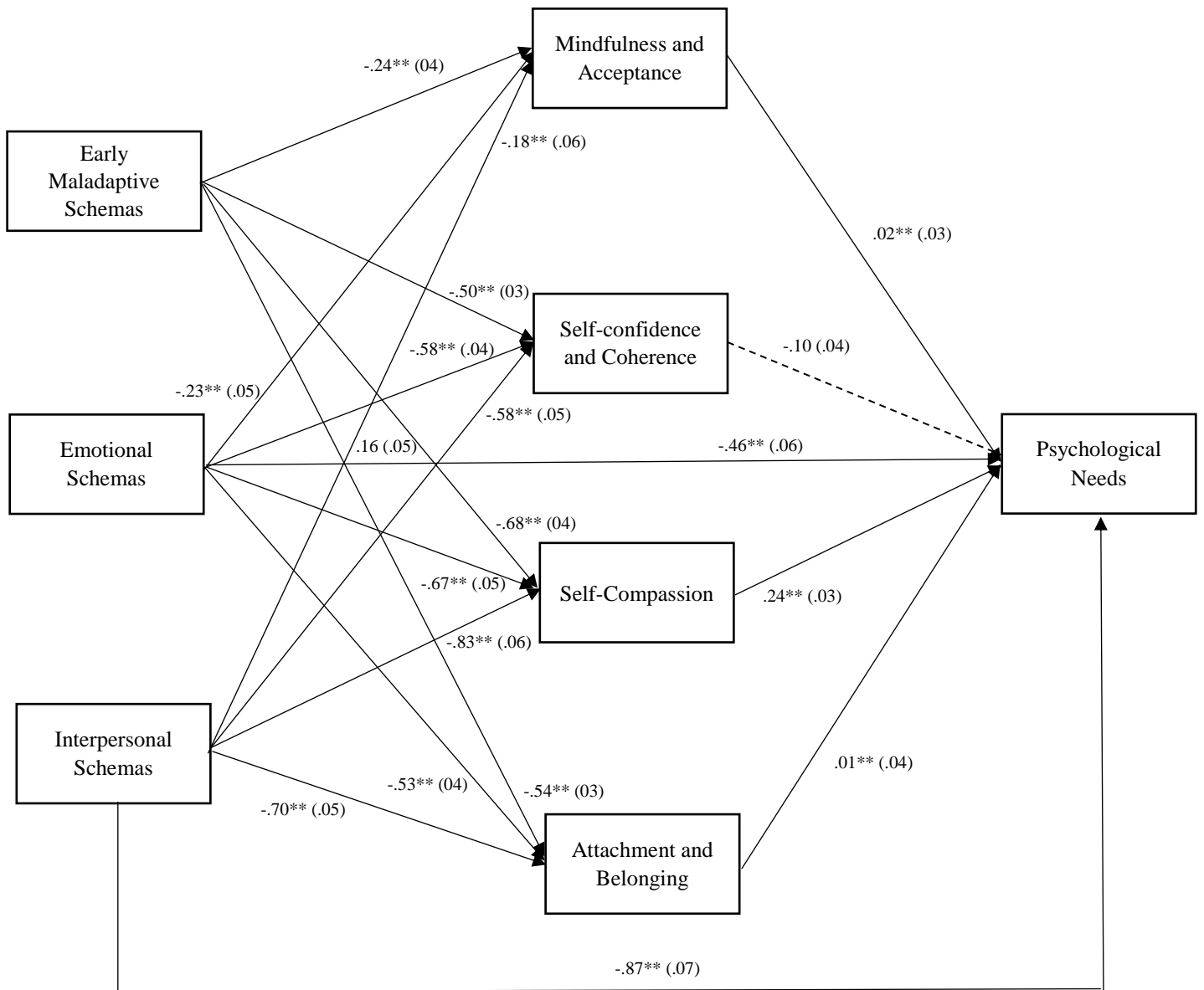
Figure 6. Best representative model of the mediation analysis of the relationship between maladaptive schematic functioning and psychological needs with mindfulness and acceptance, confidence and coherence, self-compassion, attachment, and belonging as mediators.

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To test if adaptative states of mind (healthy self), mindfulness/acceptance, self-

confidence/coherence, self-compassion/emotional fulfillment and attachment/belonging

mediate the relationships between early maladaptive schemas, emotional schemas and

interpersonal schemas and symptomatology, a complex model was tested (hypothesis 5b).

Table 10 represents the hypothesized model with early maladaptive schemas, emotional schemas, and interpersonal schemas as predictors of mindfulness/acceptance, self-confidence/coherence, self-compassion/emotional fulfillment and attachment/belonging as mediators.

The relationship between early maladaptive schemas and symptomatology was mediated by self-compassion/emotional fulfillment (b = .07, |.03 to .11|, p <.01) and attachment/belonging (b = .06, |.03 to .10|, p <.01), but not by mindfulness/acceptance and self-confidence/coherence. However, even though only two mediators emerged as statistically significant, the full model indirect effect was significant (b = .17, |.11 to .23|, p <.01). The relationship between emotional schemas and symptomatology was mediated by self-confidence/coherence (b = .04, |.01 to .09|, p <.01), self-compassion/emotional fulfillment (b = .13, |.09 to .17|, p <.01) and attachment/belonging (b = .12, |.08 to .16|, p <.01), but not by mindfulness/acceptance. However, even though only three mediators emerged as statistically significant, the full model indirect effect was significant (b = .31, |.25 to .37|, p <.01). Finally, the relationship between interpersonal schemas and symptomatology was mediated by self-confidence/coherence (b = .07, |.02 to .22|, p <.01), self-compassion/emotional fulfillment (b = .15, |.10 to .20|, p <.01) and attachment/belonging (b = .14, |.09 to .19|, p <.01), but not by mindfulness/acceptance. However, even though only three mediators emerged as statistically significant, the full model indirect effect was significant (b = .37, |.29 to .45|, p <.01). Therefore, this hypothesis was partially conformed – see table 10.

Table 10. Mediation analysis of the relationship between maladaptive schematic functioning and symptomatology with mindfulness and acceptance, confidence and coherence, self-compassion, attachment, and belonging as mediators (N = 644).

	Beta	SE	Indirect Effect	Boot SE	Lower-Limit	Upper-Limit	Sig

Early Maladaptive Schemas	.54	.03	.17	.02	.11	.23	.00
Mindfulness and Acceptance	-.03	.02	.01	.01	-.01	.02	.23
Confidence and Coherence	-.04	.03	.02	.01	-.10	.05	.16
Self-Compassion	-.11	.02	.07	.01	.03	.11	.00
Attachment and Belonging	-.12	.02	.06	.01	.03	.10	.00
Emotional Schemas	.42	.04	.31	.03	.25	.02	.00
Mindfulness and Acceptance	-02	.02	.01	.01	-.02	.02	.35
Confidence and Coherence	-.08	.03	.04	.02	.01	.09	.00
Self-Compassion	-.19	.02	.13	.02	.09	.17	.00
Attachment and Belonging	-.23	.03	.12	.02	.08	.16	.00
Interpersonal Schemas	.50	.05	.37	.04	.29	.45	.00
Mindfulness and Acceptance	-.04	.02	.01	.01	-.01	.02	.13
Confidence and Coherence	-.12	.03	.07	.02	.02	.11	.00
Self-Compassion	-.18	.02	.15	.02	.10	.20	.00
Attachment and Belonging	-.20	.03	.14	.02	.09	.19	.00

Discussion

The research aims of the second study were achieved. The exploration of several complex sequential meditations with moderations of early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains, was performed adequately. Nevertheless, some considerations may be stated.

Research question ***number one,*** which was focused on a correlational analysis, had four hypotheses. The first hypothesis was partially confirmed whereas the other three had full empirical support. Early complex trauma correlated with early maladaptive schemas and states of mind but did not correlate with emotional and interpersonal schemas, which was somewhat expected. Young and colleagues (2003) described that the early frustration of core emotional needs (which is a form of complex trauma) is the main reason underlying the development of early maladaptive schemas. These schemas are framed around core emotional needs that represent pervasive themes which are only

processed emotionally due to the lack of cognitive skills in early brain development (Cozolino, 2017). Emotional and interpersonal schemas may tend to be viewed as higher-order representational abstractions, which imply complex cognitive processing, which children do not achieve. Thus, this is consistent also with previous research wherein early complex trauma is associated with poor neurocognition (Struck et al., 2020). One alternative explanation is that individuals may defend themselves when it comes to answering a trauma-related questionnaire, and they may thus have avoided answering truly. Another likely explanation concerns sample characteristics. The sample was constituted by academic students, which means that, probably, the level of trauma-related experiences is low. Moreover, all other correlations were in the hypothesized directions. Essentially, early maladaptive schemas, emotional schemas, interpersonal schemas and states of mind were all negatively correlated with the regulation of psychological needs, which is consistent with previous findings (Faustino, 2021; Faustino & Vasco, 2020a,b,c; Faustino et al., 2020a; Fonseca, 2012; Martins, 2016). These results support the assumption that schematic functioning may be a determinant aspect of how individuals regulate their psychological needs.

The second hypothesis received full confirmation. Schematic functioning and states of mind were positively correlated with defensive maneuvers, such as defensive styles, coping mechanisms, relational cycles and emotional processing difficulties, which is consistent with previous findings (Barreira, 2016; Faustino & Vasco, 2020a,c; Martins, 2016). These results support previous assumptions that individuals use different implicit/automatic and explicit/deliberate ways to deal with emotional suffering, stressful situations, and unwanted thoughts (Cramer, 1998; Vaillant, 2020), which emerge from several dialectical maladaptive core schemas (Faustino, in prep). Defensive aspects of emotional suffering (Freud, 1923) and schematic functioning have been described by

several theoretical orientations (Dimaggio et a., 2015; Greenberg & Goldman 2017; Young, Klosko, and Weishaar, 2003).

Maladaptive schematic functioning was positively correlated with psychological inflexibility and cognitive suppression and negatively correlated with metacognition and mentalization and expressive suppression. Individuals with higher levels of maladaptive schemas tend to manifest lower levels of psychological flexibility (Faustino & Vasco, 2020a,b) and lower levels of metacognitive skills (Dimaggio et al., 2015) due to the specific features of schemas. Schemas are mental structures with rigid painful memories and images with narrow meanings and laden with dysfunctional affect, which impair the ability to be mentally flexible and to be able to decenter, as well as self-reflection and mentalization of experience (Dimaggio et al., 2015; Fonagy, 2000, Faustino et al., 2021a).

Finally, the fourth hypothesis also received full confirmation, which reflects the importance of the conceptualization of adaptive self-domains in psychotherapy. Maladaptive schematic functioning was negatively correlated with states of mind of mindfulness and acceptance, confidence and coherence, self-compassion, attachment, and belonging. These results are aligned with previous findings (Faustino et al., 2021a; Lobbestael et al., 2008) and consolidate the assumption of the development of healthy adult self-states or modes (Young et al., 2003), which counters the dysfunctionality of psychological functioning caused by the maladaptive schemas.

Research question *number two* was focused on three sequential mediations (path analysis), which corresponded to three hypotheses. The first two hypotheses received full confirmation. The first hypothesis tested a sequential path from early complex trauma to the regulation of psychological needs, with affective temperament, parenting styles, and early maladaptive schemas as path mediators. This model supports the notion that young individuals who experience some form of early complex trauma tend to increase

manifestations of pervasive affective temperament, which facilitates dysfunctional parenting styles, which contribute to the development of early maladaptive schemas, which in turn impair the regulation of psychological needs. This model received full confirmation, matching theoretical assumptions that trauma, affective temperament (Akiskal et al., 2005) and parenting styles (Baumrind, 1991) are extremely important in the development of life-long disorders and the main causes of the development of early maladaptive schemas (Young et al., 2003). Thus, early complex trauma has been associated with several personality disorders (Bierer et al., 2003; Khosravi, 2020; Struck et al., 2020; Tyrka, Wyche, Kelly, Price, & Carpenter, 2009).

The second hypothesis tested a sequential path from early maladaptive schemas to psychological needs, with emotional and interpersonal schemas as path mediators. Also, states of mind were used as a covariate. This model received full empirical support, which matches theory predictions. Within a sequential approach, early maladaptive schemas seem to be the first dysfunctional mental structures to be developed because of the frustration of core emotional needs. Then, within a constructive perspective, the following emotional schemas (beliefs and assumptions regarding emotional experiences) and interpersonal schemas (beliefs and assumptions regarding interpersonal relationships) seem to differentiate and impact cognitive, affective, and relational processing, which in turn impairs the regulation of psychological needs. Also, states of mind, which encompass the activation of several schemas, play an articulatory role in this equation. These constructs were previously explored in an isolated manner (Faustino & Vasco, 2020a,b,c,d; Faustino et al., 2020a; Martins, 2016), which supported the exploration of this innovative complex model. Implications will be further discussed.

The third hypothesis was partially confirmed. A sequential mediational model was tested, from early maladaptive schemas to psychological needs, with emotional and

interpersonal schemas and states of mind as path mediators, with metacognition/mentalization and psychological inflexibility as covariates. The full path received empirical support; however, metacognition/mentalization was not a significant covariate with states of mind. Similar to the previous model, this model implies that early maladaptive schemas are developed before emotional and interpersonal schemas, which are then built progressively and constructively, finalizing into several pervasive states of mind, which in turn impair the regulation of psychological needs. However, only psychological inflexibility covariates significantly with all variables, which is theoretically consistent (Faustino & Vasco, 2020a,b; Faustino et al., 2020a; Martins, 2016; Young et al., 2003). Metacognition and mentalization seem to be significant only for schematic functioning, which suggests differential implications on *trait-state* relationships within these variables. More research is required to explore these results.

Research question ***number three***, which was focused on several mediations had two hypotheses. The first hypothesis received full support and the second hypothesis received partial support. Defensive styles, coping strategies, dysfunctional cycles and emotion processing difficulties mediated the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and psychological needs. This supports several theory predictions discussed before, according to which individuals use several implicit and explicit strategies or mechanisms to deal with emotional suffering and dysphoric affect associated with maladaptive schematic functioning (Cramer, 1998; Dimaggio et a., 2015; Faustino 2021b; Freud, 1923; Greenberg & Goldman 2017; Vaillant, 2011; Young et al., 2003). Beyond that, this result implies that *defensive maneuvers and dysfunctional consequences* are associated to and mediated by different schemas, which means that different types of maladaptive schemas may foster similar and/or different proactive maneuvers and dysfunctional consequences. However, this

may also be a result of a lack of clear definition and differentiation of the *schema* construct, which is aligned with previous concerns, addressed by the *multidimensional core dialectical schema theory* (Faustino, in press). Implications for this result are further described.

The second hypothesis showed that the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and symptomatology was mediated by coping strategies and emotion processing difficulties, and not by defensive styles and dysfunctional cycles. These results are unexpected, but they may have some plausible explanations. Complex mediation models take several variables into account, and some variables (like schema construct) may have some overlapping dimensions. This means that the shared variance in the model would be high, which overshades "weaker" variables. Another likely explanation is that the Defensive Styles Questionnaire (DSQ-28) aims to operationalize consciously the unconscious analytic defenses, which may be viewed as problematic (Cramer, 1998; Vaillant, 2020). Individuals may be unaware of their implicit/unconscious defensive styles, giving inconsistent responses to the DSQ-28, which may weaken the variable weight on the equation. Thus, regarding relational cycles, the situation is the same. The Interpersonal Relational Patterns Questionnaire (IRPQ) operationalizes relational patterns that may be difficult for individuals to respond to, leading to inconsistencies in the responses, again weakening the variable weight on the mediation equation model. This may be a plausible interpretation because, when we look at the correlational analysis, defensive styles and relational cycles are positively correlated with maladaptive schematic functioning, which supports theory predictions regarding associations between schemas, defensive styles (Walburg & Chiaramello, 2015), coping mechanisms, (Faustino et al., 2020a), relational cycles (Faustino & Vasco,

2020a) and emotion processing difficulties (Faustino & Vasco, 2020c). More research is required to explore these contradictory results.

Research question *number four,* which was focused on a mediation analysis, had two hypotheses, which received partial confirmations. Metacognition and mentalization, psychological inflexibility, expressive suppression and cognitive reappraisal mediated the relationships between early maladaptive schemas and interpersonal schemas, and psychological needs. In the regressions within the model, positive effects were found regarding metacognition and mentalization and cognitive reappraisal and negative effects were found with psychological inflexibility and expressive suppression. Based on these results, individuals with maladaptive schemas who have higher levels of metacognition and mentalization and cognitive reappraisal are more able to regulate their psychological needs than individuals who have lower levels of metacognition/mentalization and cognitive reappraisal. Thus, expressive suppression and psychological inflexibility emerged with an opposite pattern, which is consistent with previous theoretical assumptions (Faustino, 2020). However, the mediation effect of cognitive reappraisal in the relationships between emotional schemas and psychological needs was not significant. This was unexpected because cognitive reappraisal has been previously described as an adaptive variable associated with the regulation of psychological needs (Barreira, 2016; Castelo-Branco, 2016).

The second hypothesis was focused on a similar model of the relationship between maladaptive schematic functioning and symptomatology with the same mediators. Psychological inflexibility was a significant mediator of the relationship between early maladaptive schemas, emotional schemas and interpersonal schemas and symptomatology, which was in line in previous findings (Faustino & Vasco, 2020a,b). However, metacognition and mentalization was not a significant mediator of any variable.

This was unexpected, given theoretical predictions regarding the associations between these two variables with symptomatology (Faustino et al., 2021a; Dimaggio et al., 2015; Fonagy, 2000). One likely explanation is that this result may be due to the composite score that was developed to match an integrative index of both constructs. In the future it would be interesting to develop a pure integrative measure of these two constructs to see if the results emerge. Another likely explanation is that this result may be due to sample features. Maybe if these models were tested in pure clinical samples the mediational effect would have emerged.

Research question *number five* was focused on a mediation analysis and had two hypotheses, which received partial confirmations. Overall, adaptive states of mind (healthy self), mindfulness/acceptance, self-confidence/coherence, self-compassion/fulfillment, and attachment/belonging mediated the relationships between early maladaptive schemas, emotional schemas and interpersonal schemas, and psychological needs. However, there were some particularities. Attachment/belonging did not mediate the relationship between early maladaptive schemas and psychological needs, which was unexpected. One likely explanation may be that the present sample is not a pure clinical sample, which means that attachment core needs may be adequately fulfilled to a degree that they are not expressed in this mediation model. Self-confidence/coherence did not mediate the relationship between emotional and interpersonal schemas and psychological needs. And mindfulness/acceptance did not mediate the relationship between interpersonal schemas and psychological needs. Taken all together these results seem to support the notion that there are differential aspects of the self with different implications regarding maladaptive schematic functioning. These are all preliminary results that need to be taken carefully, as these complex models require replication before one can engage in definitive explanations.

The second hypothesis was focused on a similar model of the relationship between maladaptive schematic functioning and symptomatology with the same mediators. Similar results were found regarding differential effects of adaptive self-domains as significant mediators. Mindfulness/acceptance and self-confidence/coherence did not mediate the relationship between early maladaptive schemas and psychological needs. Thus, mindfulness/acceptance did not mediate any model. Similar to the previous models, these results may be easily explained by sample features. However, this does not discard the previous theoretical and empirical findings regarding mindfulness/acceptance as core variables on adaptive psychological functioning (Chamberlain & Haaga, 2001; Faustino et al., 2020a; Hayes et al., 2011; Thim, 2017).

Limitations and Future Directions

Some limitations may be stated. Data were acquired with self-reported instruments, which are limited to participants' self-awareness on the given constructs. This study was conducted on-line, without a presently supervision of the main researcher. This study was based on complex structural equations models (SEM), which may have narrowed some associations with some variables. SEM need robust samples to support complex calculations. Despite this sample size ($N = 644$), some relationships between variables in complex models may not emerge, which does not mean that these relationships do not exist beyond research models. The sample under study had many more female responders that male responders, which could have introduced biases to the results. Finally, this study was conducted with university participants who configured a non-clinical sample.

Conclusions

The aims of the second study were achieved. Complex relationships between early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains were explored. Differential effects were found regarding each specific SEM model. Results suggest that these are core variables for the identification, explanation and description of dysfunctional personality patterns and symptomatology. Therefore, based on these preliminary results this model adopts these core variables as foundational for psychological case conceptualization and clinical decision-making. However, more research is required to deepen and replicate these findings.

Study 3 - Relationships between psychological and neurocognitive domains related

with psychotherapy

Relationships between psychological and neurocognitive domains related with psychotherapy

Abstract

Underlying human mental processing, there are complex and intricate interactions and relationships between psychological and neurocognitive variables. The present doctoral proposal acknowledges this reality and postulates that the identification of these relationships is essential for case conceptualization and psychological intervention. However, previous research showed that the study of these relationships is extremely complex. Therefore, the present study aims to explore the relationships of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains with several neurocognitive variables. Several individuals (*N*=96) responded to self-report questionnaires and were assessed with a neuropsychological battery. Pearson correlations were used to explore associations between variables. As expected, correlational scores do not follow a regular pattern. Executive functions were negatively correlated with maladaptive schematic functioning and with defensive maneuvers and dysfunctional consequences. Memory only correlated with psychological needs, self-trust and with dysfunctional interpersonal cycles. These results emphasize previous assumptions that there is a difference between self-report questionnaires and behavioral tasks which may difficult the integrated study of psychological and neurocognitive processes. Overall, results provide partial support to the theorized model. Implications for these results are discussed.

Introduction

The complexity of human mental functioning is way beyond simple causal explanations and descriptions based on self-report questionnaires. The interactive nature of the human mind and brain processes is a reality that needs to be acknowledged by mainstream science. The development of new and powerful research instruments (e.g., fMRI) allows the study in real-time of the activation and deactivation patterns of human cortices, based on blood supply, regarding specific cognitive and affective tasks (Kandel, 2013; Cozolino, 2017). This was not possible before, due to the lack of technology. Thus, neuroimaging and psychophysiological methods combined with self-report questionnaires and neurocognitive functional assessment may support a paradigm shift when it comes to the study of personality domains and brain processes. Moreover, through neuropsychological assessment, it is also possible to explore the dimensionality of several neurocognitive processes (e.g., executive functions, memory), which are essential brain processes in daily life functioning (Diamond, 2013).

The integration of personality domains and neurocognition is a very promising field of research, not only because it augments the understanding of human personality, but also because it may open new avenues for clinical case conceptualization (Cozolino, 2017; Faustino, in prep). However, despite these important and exciting avenues for the exploration of human mental functions, previous research showed some limitations regarding construct associations between self-report measures and behavioral tasks (Milyavskaya et al., 2018; Paap et al., 2020; Wennerhold & Friese, 2020). The lack of convergent validity between these two methods of data acquisition may raise some concerns when it comes to construct validity. This will be detailed below.

Furthermore, this is the third study of the present doctoral proposal and it is focused on the exploration of associations between early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains and the major neurocognitive processes, namely, executive functions, attention, memory, perception and language.

Neurocognition and Dispositional Traits

The need for the integration of neurocognition in the study of human personality and case conceptualization is at its dawn. Several authors emphasize the importance of executive functions, attention and memory for human personality (Diamond, 2013; Lezak et al., 2014; Stuss & Knight, 2013) and in psychotherapy (Cozolino, 2017; Grawe, 2005; Kandel, 1998; Siege, 1999; Tyron, 2014). However, this integration does not prove to be an easy task, especially when it comes to the articulation between several dispositional traits (e.g., maladaptive schemas and coping) and contextual states (e.g., states of mind) which are at the basis of the present doctoral proposal. Despite strong theoretical rationales for the association between neurocognition and personality, previous research is very limited when it comes to the study of associations between neurocognition and maladaptive schematic functioning and states of mind, even though previous models emphasized this articulation (Shalice & Shalice, 1998). This will be further discussed.

Previous research links childhood trauma and neurocognition, which is aligned with previous theorization. Several meta-analyses document associations between early complex trauma and early psychosis (Vargas et al., 2019), developmental neurocognitive deficits (Kavanaugh et al., 2019), attachment disorders (Zilberstein, 2014) and neurocognitive impairment in individuals with post-traumatic stress disorder (PTSD,

Nijdam et al.,2018). Research has also been focused primarily on associations between neurocognitive processes and dispositional traits. Schretlen and colleagues (2012) explored the relationships between openness in relation to intelligence, fluency, and executive functioning. They found that openness was strongly correlated with verbal/crystallized intelligence, that executive functioning, and verbal fluency. The authors concluded that openness may be more related with broad verbal skills and knowledge than with executive functions. Murdoc and colleagues (2013) explored associations between cognitive flexibility, inhibition and updating/monitoring and Big Five personality traits. They found that the executive process of updating/monitoring was negatively associated with neuroticism and positively associated with openness and openness was also positively associated with cognitive flexibility. The authors suggested that neuroticism and openness may share some underlying updating/monitoring features. Waris and colleagues (2018) performed a systematic review of previous evidence of the relationship between working memory and Big Five personality traits. The authors only identified significant negative correlations between updating/monitoring and conscientiousness and openness with the n-back WM task. They concluded that it was not possible to document robust associations between working memory and Big Five personality traits. Several reasons were described, which will be detailed below.

Moreover, several studies explored the relationships between coping strategies and neurocognition, especially in clinical samples. Some examples may be given. In a prospective study, Evans and colleagues (2017) explored relationships between working memory and cognitive flexibility and coping and depressive symptoms in children. They found that deficits in working memory predicted increases in depressive symptoms four months later. Also, the relationship between working memory and depressive symptoms was partially mediated by primary and secondary control coping and the relationship

between cognitive flexibility and depressive symptoms was partially mediated by secondary control coping. Lysaker and colleagues (2004) documented that neurocognition and personality were independently related to coping style. In a clinical sample of individuals with schizophrenia, low neurocognitive abilities and higher neuroticism predicted higher use of passive avoidant strategies, whereas higher levels of extroversion were associated with greater social support seeking. Lysaker and colleagues (2011) also documented that individuals with higher mastery abilities (metacognitive domain) showed higher coping openness, insight, self-esteem, and neurocognitive abilities (cognitive flexibility, global verbal intellectual function and visual spatial ability). MacAulay and Cohen (2013) found that the trait of negative affect was a better predictor of avoidant coping than the neurocognitive process of attention and memory in schizophrenia spectrum disorders.

There is a substantial amount of evidence that neurocognition and personality traits are associated even though they may be regarded as separate domains. Also, clinical models and empirical data support that assumption. Faustino (2021a), based on a complex neuronal perspective, postulated that the neurocognitive psychological syndrome may be an evidence of the association between neurocognition, dispositional traits and contextual states.

Neurocognitive Psychological Syndrome and Maladaptive Schemas

The Neurocognitive Psychological Syndrome (NPS) encompasses a cluster of neurocognitive deficits in executive functions, attention, memory, and self-perception that may be present in anxiety, mood and schizophrenia spectrum disorders (Faustino, 2021). These neurocognitive deficits are attributed to aberrant nodes (deficits in neural connectivity centers) in four major neural networks: (1) Frontal-parietal executive

network (FPEN), (2) Salience network (SN), (3) Amygdaloid-hippocampal memory network (AHMN), and (4) Default Mode-Network (DMN); see Faustino (2021) for details. The study of the validity of NPS is still on its infancy, which means that the associations with other constructs are unexplored. However, a partial integration of the NPS and maladaptive schematic functioning was described in the previous section. Here, I will just summarize the proposal.

Norman and Shallice (1998) proposed a model of the supervisor attentional system (SAS) where attention and action schemata become activated or suppressed due to salience properties. Schemas, scripts or underlying assumptions influence the cascade of mental processes based on the triggering stimulus. Under the SAS, the activation of a schema-driven and stimulus congruent procedure is selected based on well-learned and robust mental elaboration, where other competing schemas are inhibited. Some clinical examples may be given. An individual with a core abandonment schema will be vulnerable to central or peripheric clues of distancing. When a friend misses a date, this will be likely interpreted and magnified as "he/she does not care about me and I will be alone forever". An individual with a core defectiveness schema will be vulnerable to central or peripheric clues of criticism. When a co-worker makes a fair criticism of a document, this will be likely interpreted and magnified as "his/her criticism is so true, I am a fraud". The activation of the stimulus congruent maladaptive schema leads to a self-reinforced conviction and the associated schema elements, such as prototypical dysphoric affect, stereotyped autobiographical memories, attentional focus on past-failures, inflexibility, and self-fragmentation (Faustino, in prep).

However, despite this coherent theoretical assumption, more research is required to test and explore these articulations. As sated before, there are some methodological challenges when it comes to the exploration of the associations between dispositional

variables (e.g., maladaptive schemas) and neurocognitive processes (e.g., executive functions). Typically, maladaptive schemas, defensive styles or coping strategies are assessed with self-report questionnaires and neurocognitive processes are assessed with neuropsychological tests. These methods of assessment are very distinct and may lead to empirical contradictions that challenge theoretical assumptions.

Low Convergence between Self-Report instruments and Neuropsychological Tests

When we think of multiple assessment of human psychological and neurocognitive assessment, it is expected that similar constructs and domains would show some level of convergence. However, this is not always the case. There is a substantial amount of evidence that supports a dissociation between self-report instruments and performance-based tasks (Wennerhold & Friese, 2020).

This lack of convergence is found in studies with almost null correlations between self-report measures of trait self-control and behavioral inhibition tasks and between trait self-control with conscientiousness and impulsivity (Eisenberg et al., 2019; Sanders et al., 2018). Sanders and colleges (2018) reported in a meta-analysis (N > 2,600) that self-control is not associated with inhibition-related executive functions, based on stablished neurocognitive tasks (Stroop test, Stroop, 1935, and the Flanker task, Eriksen & Eriksen, 1974). Buchanan (2016) found that in nonclinical samples, self-reported impairments on executive functions correlated with neuroticism and were associated with low conscientiousness. However, self-reported impairments on executive functions did not correlate with some neuropsychological tests of executive functions (trail making, phonemic fluency, semantic fluency, or digit span tests). One major conclusion is that self-report measures of executive functions may not be proxies for executive functioning as measured by behavioral tests. Williams and colleagues (2017) documented that self-

reported attentional control was uncorrelated with behavioral performance measures of attentional control, but correlated with self-report neuroticism and conscientiousness. Moreover, the lack of associations between self-report measures and performance-based tasks is very well documented in the literature (Milyavskaya et al, 2018; Paap et al., 2020; Wennerhold & Friese, 2020).

Some reasons can be given to explain these phenomena. First, maybe self-report measures of dispositional traits do not capture moment-to-moment fluctuations of the manifestation of that trait, which impairs the association between a self-reported scores (measurement of single versus repeated performance) and the behavioral manifestation of that specific trait. Second, maybe individuals perform biased self-assessments of their traits, which impairs associations (distinction between typical and maximum performance). Third, maybe construct variability and construct dimensionality are better captured by two different assessment methods which are uncorrelated (differences between construct expressions). Fourth, maybe performance-based tasks are focused on a specific facet whereas self-reported instruments are focused on construct generalization (Saunders et a., 2018; Wennerhold & Friese, 2020). These notions require further empirical exploration.

Research Issues and Hypotheses

Based on the previous theorizations, it is possible to explore the associations between early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains and several neurocognitive variables. This study has an exploratory basis due to the lack of previous studies regarding maladaptive schemas

and neurocognition. Nevertheless, lower-to-medium associations between dispositional traits and neurocognitive variables (e.g., executive functions) are expected. In this sense, the following hypotheses arise:

Hypothesis 1: Early disorder determinants are associated with neurocognition

Hypothesis 2: Maladaptive schematic functioning and states of mind are associated with neurocognition

Hypothesis 3: Defensive maneuvers and dysfunctional consequences are associated with neurocognition

Hypothesis 4: Mental abilities and processes are associated with neurocognition

Hypothesis 5: Adaptive self-domains are associated with neurocognition

Hypothesis 6: Maladaptive psychological variables are associated with cognitive inflexibility, while adaptive psychological variables are associated with cognitive flexibility.

Methods

Participants

The sample consisted of 96 participants, 16 males (16.7%) and 80 females (83.3%), with an age range between 18 and 41 years old (M=20.78, SD=4.63). For years of education, all of the sample had completed the 12th year (100%). Almost all of the sample was Portuguese 95 (99.0%) The frequencies and percentages distribution of the sample regarding marital status is: 91 (94.8%) were single, 4 (4.2%) were married, 1 (1.0%) were in nonmarital partnership. Thirty-five individuals (36.5%) were engaged in psychotherapy with several self-reported diagnoses, being major depression (n=5, 5.2%), and depression and anxiety (n=4, 4.2 %) the most prevalent – see table 1 for details.

Table 1. Descriptive statistics of the sample under study

		Frequencies and percentages
N		96 (100%)
Age		
	M	20.78
	SD	4.63
	Minimum	18
	Maximum	41
Gender		
	Male	16 (16.7%)
	Female	80 (83.3%)
Nationality		
	Portuguese	95 (99.0%)
	Brazilian	1 (1.0%)
Scholarship		
	12º year	96 (100%)
Marital Status		
	Single	91 (94.8%)
	Married	4 (4.2%)
	Nonmarital partnership	1 (1.0%)
Psychotherapy		
	Yes	35 (36.5%)
	No	61 (63.5%)
Self-reported diagnosis		
	Major Depression	5 (5.2%)
	Depression and Anxiety	4 (4.2%)
	Depression and Anorexia Nervosa	2 (2.1%)
	Feeding Compulsion Disorder	2 (2.1%)
	Generalized Anxiety Disorder	1 (1.0%)
	Panic Disorder	1 (1.0%)
	Obsessive Compulsive Disorder	1 (1.0%)
	Unspecified	4 (4.2%).

Self-Report Instruments

In this study, self-report questionnaires and neuropsychological instruments were used. To see instrument specific details, see the previous section – *methodology* - of the present doctoral proposal. Internal consistency and instruments scores are detailed in table 2. Based on previous theorizations, several self-report questionnaires were used to assess ***early disorder determinants***. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of Memphis, Pisa, Paris and San Diego auto-questionnaire version (TEMPS-A, Akiskal et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et a., 2012) was used. Finally, to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess ***maladaptive schematic functioning and states of mind.*** To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Lehay Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020d) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

To assess ***defensive maneuvers and critical consequences,*** different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28 (DSQ, Saint-Martin, Valls, Rousseau, Callahan & Chabrol, 2013, revised Portuguese version by Martins, 2016) was used. To assess coping strategies, the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth &Pokorny 1999, revised Portuguese version by Martins, 2016) was used. Finally, to assess emotional processing difficulties, the Emotional Processing Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, in press) was used.

*Mental **skills and processes*** were assessed with different self-report measures. Metacognition and mentalization were assessed with a combined score from the Metacognitive Self-Assessment Scale (MSAS, Pedone et al., 2017, Portuguese version by Faustino et al., 2019a). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório & Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009) was used. Finally, to assess ***adaptive self-states,*** the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

Neurocognitive domains and Assessment Indexes

A neuropsychological battery was assembled to assess the relevant neurocognitive domains. ***Executive functions and Abstraction*** were assessed with several indexes from different neuropsychological tests. ***Cognitive Flexibility*** was assessed via the conceptual

index from the Wisconsin Card Sorting Test (WCST, Berg, 1946). *Updating/Working Memory* was assessed with the Reversed Digit Score from the Wechsler Memory Scale (WMS, Wechsler, 1987, Portuguese translation by CEGOC, 2008). *Inhibition* was assessed with the word-color score from the Stroop Test (ST, Trenerry et al., 1995, Portuguese version by Castro et al., 2009). *Speed of processing* was assessed with the digit-symbol subtest and *abstraction* was assessed with the similarities subtest from the Wechsler Adult Intelligence Scale (WAIS-III, Wechsler, 1997, Portuguese version by Ferreira, Machado & Rocha, 2008).

Learning and Memory Processes were assessed with several indexes from Wechsler Memory Scale (WMS, Wechsler, 1987, Portuguese translation by CEGOC, 2008). Short-term thematic memory was assessed with the Logic Memory Subtest. The Learning Score was obtained with the respective score from the previous task. The *recognition process* and *recall process* indexes were also obtained from the previous task.

Complex Attention and Perceptive Organization were assessed with different neuropsychological instruments. *Divided attention* was evaluated with the letter-number subtest from the Wechsler Memory Scale (Wechsler, 1987, Portuguese translation by CEGOC, 2008), while *sustained attention* was evaluated with the word-canceling task, from the Stroop test (ST, Trenerry et al., 1995, Portuguese version by Castro et al., 2009). *Immediate perception* was assessed with the copy task and *delayed perception* was assessed with picture recall, both from the Rey Complex Figure (RCF, Rey 1959, Portuguese translation by CEGOC, 2002).

Language and Communication were assessed with the semantic and fluency tasks (Benton, 1967, Portuguese adaptation by Simões et al., 2012). *Semantic fluency* was assessed with the correct responses score, while *semantic errors* were assessed with number of errors of the first letter of the semantic task. Phonemic fluency was assessed

with the correct responses score, while ***phonemic errors*** were assessed with number of errors of the first letter of the phonetic task.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020, and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality assured. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. Regarding the neuropsychological assessment, when individuals were filling the research protocol they were asked if they wanted to participate in a neuropsychological assessment. From the sample pool that selected yes, individuals were randomly selected and contacted via email to participate in the neuropsychological assessment. A bonification was given to each participant who completed the entire battery. The inclusion criteria were being over 18 and below 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder. This research was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

This present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used for sample exploration. Brown (2006) skewness values should vary between −3 and +3 and kurtosis values between −10 to +10 to be adequate Skewness and kurtosis were acceptable and a 95% confidence interval was assumed with a *p*-value of .05 (Pallant, 2007. To explore the association between constructs, Pearson correlations were used. To explore path analysis and mediation models, the macro process for SPSS (Hayes, 2013) was used. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

The following section details the statistical analyses that were performed to test the study hypotheses and research aims. Descriptive statistics, such as internal consistency, means and standard deviations, are described in table 2.

Table 2. Descriptive statistics of the psychological variables under study.

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.75	2.20	.22	1.57	2.86	.35	.84
Affective Temperament (TEMPS-A)	.83	2.46	.47	1.58	3.56	.27	-.65
Parenting Styles (YPI)	.93	1.36	.14	1.10	1.95	.92	2.03
Psychological Needs (NSRS-43)	.88	5.49	.76	3.40	6.84	-.53	-.15
Symptomatology (BSI-53)	.97	1.17	.73	.08	3.04	.51	-.63
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.55	.71	1.06	4.11	.27	-.35
Emotional Schemas (LSS-50)	.87	3.07	.53	2.02	4.59	.49	.01
Interpersonal Schemas (IIP-32)	.96	1.64	.64	.53	3.06	.50	-.83
States of Mind (SMQ)	.94	2.75	.69	1.30	4.45	.21	-.28
Defenses and Critical Consequences							
Defensive Styes (DSQ-29)	.71	4.36	.76	2.64	6.11	.14	-.37
Coping Strategies (Coping index of SMQ)	.90	3.13	.83	1.17	5.13	.26	-.20
Dysfunctional Interpersonal Cycles (IRPQ)	.84	2.89	.29	2.07	3.79	-.19	.43
Emotion Processing Difficulties (EPDS-R)	.89	2.66	.60	1.27	4.41	.39	.37
Mental Skills and Processes							
Metacognition (MSAS)	.67	3.96	.34	3.04	4.82	.00	-.07
Psychological inflexibility (CFQ)	.93	3.94	1.44	1.00	6.86	-.16	-.60
Cognitive Reappraisal (ERQ)	.87	4.47	1.24	1.33	7.00	-.41	-.44
Experiential Suppression (ERQ)	.77	3.32	1.22	1.25	6.00	.19	-.83
Adaptative Self Domains							
Attachment/Belonging (SMQ)	.56	4.01	1.00	2.25	6.00	.04	-.90
Self-Confidence/Coherence (SMQ)	.61	4.36	1.01	2.25	6.00	-.28	-.98
Acceptance/Mindfulness (SMQ)	.21	3.58	.83	1.00	5.75	-.30	.85
Compassion/Emotional Fulfilment (SMQ)	.53	3.95	1.05	1.50	6.00	-.36	-.68

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-

R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Descriptive statistics regarding neurocognitive variables, such as means, and standard deviations, are described in table 3.

Table 3. Descriptive statistics of the neurocognitive variables under study.

	Mean	SD	Min	Max	Skewness	Kurtosis
Executive Functions and Abstraction						
Cognitive Flexibility (Conceptual index of WCST)	64.28	9.27	19.00	106.00	.23	9.55
Updating/Working Memory (Reversed digits of WMS)	7.26	2.19	3.00	12.00	.24	-.59
Inhibition (Color-word index of Stroop test)	11.24	6.55	1.00	31.00	.47	-.50
Speed Processing (Code task of WAIS-III)	79.90	11.13	46.00	100.00	-.54	.18
Abstraction (Similarities task of WAIS-III)	22.99	4.07	12.00	33.00	-.06	-.34
Learning and Memory Processes						
Short-Term Memory (Thematic memory index of WMS)	15.73	3.32	7.00	23.00	-.10	.05
Learning Score Learning index of WMS)	5.03	3.07	-2.00	12.00	-.01	-.62
Recognition Process (Recognition memory index of WMS)	27.09	2.21	20.00	30.00	-1.06	1.11
Recall Process (Recall index of WMS)	6.21	2.11	1.00	8.00	-1.02	-.05
Complex Attention and Perceptive Organization						
Divided Attention (Word-Number index of WAIS-III)	10.54	2.02	7.00	17.00	.32	.27
Sustained Attention (Number-sequences of WAIS-III)	10.71	2.22	5.00	16.00	-.15	-.08
Immediate Perception (Copy task of RCF)	2.10	1.36	1.00	6.00	1.10	.19
Delayed perception (Recall task of RCF)	2.11	1.53	1.00	6.00	1.20	.19
Language and Communication						
Semantic Fluency (Correct responses index of SPFT)	19.77	3.25	13.00	25.00	-.08	-.96
Semantic Errors (Errors responses index of SPFT)	.21	.81	.00	6.00	5.37	32.77
Phonemic Fluency (Correct responses of SPFT)	12.02	3.60	5.00	31.00	1.46	6.82
Phonetic Errors (Errors responses of SPFT)	.31	.64	.00	3.00	2.11	4.02

Note: WCST: Wisconsin Card Sorting Test; WMS: Weschler Memory Scale; WAIS-III: Wechsler Adult Intelligence Scale; RCF: Rey Complex Figure; SPT: Semantic and Phonemic Fluency Task.

Correlational analyses were conducted to test all hypotheses in this study. Overall, statistically significant correlations were found in the expected directions. Symptomatology correlated negatively with cognitive flexibility ($r = -.20$, $p <.01$) and with inhibition ($r = -.40$, $p <.01$). Affective temperament correlated negatively with

cognitive flexibility ($r = -.21$, $p <.01$), while psychological needs correlated positively with inhibition ($r = .39$, $p <.05$) and processing speed ($r = .39$, $p <.01$). All maladaptive schemas and states of mind correlated negatively with inhibition, namely, early maladaptive schemas ($r = -.30$, $p <.01$), emotional schemas ($r = -.32$, $p <.01$), interpersonal schema ($r = -.53$, $p <.01$) and states of mind ($r = -.24$, $p <.01$) – see table 4.

Table 4. Pearson correlations between personality domains and executive functions/abstraction (N= 96).

	Executive Functions and Abstraction				
	Cognitive Flexibility	Updating/Working Memory	Inhibition	Processing Speed	Abstraction
Early Disorder Determinants					
Symptomatology	-.20*	.01	-.40**	-.04	-.14
Early Complex Trauma	-.12	-.14	-.02	.03	.14
Parenting Styles	-.19	.08	-.12	.11	.16
Affective Temperament	-.21*	.16	-.19	.04	.04
Psychological Needs	.01	.00	.39**	.23*	.09
Maladaptive Schemas and States					
Early Maladaptive Schemas	-.14	.05	-.30**	-.10	-.16
Emotional Schemas	-.12	.09	-.32**	-.10	-.10
Interpersonal Schemas	-.11	.11	-.53**	-.02	-.18
States of Mind	.06	.14	-.24*	-.09	-.12
Defenses and Critical Consequences					
Defensive Styes	-.12	.03	-.08	.02	.20*
Coping Strategies	-.16	.04	-.22*	-.06	-.17
Dysfunctional Interpersonal Cycles	-.11	-.17	.09	-.10	.01
Emotion Processing Difficulties	-.13	.11	-.37**	-.09	-.09
Mental Skills and Processes					
Metacognition	.04	.03	.23*	.04	.15
Psychological inflexibility	-.11	.04	-.29**	-.08	-.06
Cognitive Reappraisal	-.06	-.17	.09	.16	.11
Experiential Suppression	.03	.11	-.19	-.10	-.13
Adaptative Self Domains					
Attachment/Belonging	.14	.22*	.20*	.06	-.01
Self-Confidence/Coherence	.01	-.14	.23*	.13	.02
Acceptance/Mindfulness	.03	-.13	.07	.13	.13
Compassion/Emotional Fulfilment	-.18	.24*	-.16	-.02	-.03

*Note: *p<.01; ** p<.05;*

Table 5 describes the correlational analysis between all dispositional traits and contextual states, and learning and memory processes. Psychological needs correlated positively with learning score ($r = .223$ $p < .01$), dysfunctional interpersonal cycles correlated negatively with short-term thematic memory ($r = -.20$, $p < .01$), expressive suppression correlated positively with recall process ($r = .24$, $p < .01$) and self-confidence/coherence correlated negatively with recognition process ($r = -.21$, $p < .01$) – see table 5.

Table 5. Pearson correlations between personality domains and learning and memory processes (N= 96).

	Learning and Memory Processes			
	Short-Term Thematic Memory	Learning Score	Recognition Process	Recall Process
Early Disorder Determinants				
Symptomatology	-.10	-.18	.08	.01
Early Complex Trauma	-.07	.00	-.03	-.06
Parenting Styles	.08	.00	.09	-.01
Affective Temperament	.02	.03	-.05	.09
Psychological Needs	.10	.23*	-.18	.06
Maladaptive Schemas and States				
Early Maladaptive Schemas	-.07	-.01	.17	.09
Emotional Schemas	-.11	-.05	.15	.08
Interpersonal Schemas	-.10	-.09	.08	.12
States of Mind	-.06	-.07	.14	.04
Defenses and Critical Consequences				
Defensive Styes	.03	-.11	.02	.13
Coping Strategies	-.02	-.12	.12	.07
Dysfunctional Interpersonal Cycles	-.20*	-.15	-.11	-.04
Emotion Processing Difficulties	-.06	-.15	.14	.01
Mental Skills and Processes				
Metacognition	.04	.18	-.16	-.02
Psychological inflexibility	-.11	-.11	.11	.03
Cognitive Reappraisal	-.17	.02	-.17	-.02
Expressive Suppression	-.07	-.02	.11	.24*
Adaptative Self Domains				
Attachment/Belonging	.12	.02	-.14	-.05

Self-Confidence/Coherence	.00	.17	-.21*	-.03
Acceptance/Mindfulness	.04	.13	-.06	.04
Compassion/Emotional Fulfilment	.03	.06	-.16	.00

Note: *p<.01; ** p<.05;

In table 6, correlations between all dispositional traits and contextual states, and complex attention and perceptive organization are described. Symptomatology correlated negatively with delayed perception ($r = -.22$, $p <.01$), psychological needs correlated negatively with immediate perception ($r = -.25$, $p <.01$), early maladaptive schemas correlated positively with sustained attention ($r = .21$, $p <.01$) and interpersonal schemas also correlated positively with sustained attention ($r = .31$, $p <.05$ – see table 6.

Table 6. Pearson correlations between personality domains and complex attention and perceptive organization (N= 96).

	Complex Attention		Perceptive Organization	
	Divided Attention	Sustained Attention	Immediate Perception	Delayed perception
Early Disorder Determinants				
Symptomatology	-.02	.17	.18	-.22*
Early Complex Trauma	-.18	-.04	-.05	-.11
Parenting Styles	.09	-.06	-.12	-.06
Affective Temperament	.12	.14	.01	.08
Psychological Needs	-.12	-.17	-.25*	-.19
Maladaptive Schemas and States				
Early Maladaptive Schemas	-.04	.21*	.14	.17
Emotional Schemas	.03	.12	.18	.16
Interpersonal Schemas	.06	.31**	.17	.16
States of Mind	.04	.19	.19	.15
Defenses and Critical Consequences				
Defensive Styes	-.06	-.06	-.09	-.03
Coping Strategies	.01	.15	.19	.13
Dysfunctional Interpersonal Cycles	-.23*	-.04	-.07	-.10
Emotion Processing Difficulties	-.04	.08	.17	.20
Mental Skills and Processes				
Metacognition	-.18	-.19	-.21*	-.03
Psychological inflexibility	.07	.24*	.22*	-.25*
Cognitive Reappraisal	-.28**	-.13	-.01	.01

	Semantic Fluency	Semantic Errors	Phonemic Fluency	Phonetic Errors
Experiential Suppression	-.14	.07	.11	.09
Adaptative Self Domains				
Attachment/Belonging	-.14	-.13	-.20	.21*
Self-Confidence/Coherence	-.12	-.18	-.14	-.17
Acceptance/Mindfulness	-.05	-.08	-.20	-.05
Compassion/Emotional Fulfilment	-.17	-.02	-.04	.01

*Note: *p<.01; ** p<.05;*

Table 7 describes the correlational analysis between all dispositional traits and contextual states, and language and communication. Symptomatology correlated negatively with semantic errors ($r = -.23$, $p <.01$), while parenting styles correlated positively with semantic errors ($r = .21$, $p <.01$), phonemic fluency ($r = .22$, $p <.01$), and phonetic errors ($r = .23$, $p <.01$). Affective temperament correlated positively with sematic errors ($r = .22$, $p <.01$), and interpersonal schemas also correlated positively with sematic errors ($r = .23$, $p <.01$) – see table 7.

Table 7. Pearson correlations between personality domains and language and communication (N= 96).

	Language and Communication			
	Semantic Fluency	Semantic Errors	Phonemic Fluency	Phonetic Errors
Early Disorder Determinants				
Symptomatology	-.17	.23*	.01	.10
Early Complex Trauma	.01	-.15	.06	-.17
Parenting Styles	.05	.21*	.22*	.23*
Affective Temperament	.05	.22*	.16	.20*
Psychological Needs	.16	.01	-.07	.19
Maladaptive Schemas and States				
Early Maladaptive Schemas	-.11	.15	.16	.02
Emotional Schemas	-.11	.11	.08	-.04
Interpersonal Schemas	-.11	.23*	.08	.19
States of Mind	-.12	.16	.17	-.02
Defenses and Critical Consequences				
Defensive Styes	-.04	.07	.18	.11
Coping Strategies	-.12	.14	.17	-.03
Dysfunctional Interpersonal Cycles	-.03	-.04	.13	.05

Emotion Processing Difficulties	-.16	.18	.20*	.00
Mental Skills and Processes	.02	.04	-.16	.07
Metacognition and Mentalization	-.21*	.11	.07	-.14
Psychological inflexibility	-.05	.00	.03	.08
Cognitive Reappraisal	-.08	.10	.01	-.01
Experiential Suppression				
Adaptative Self Domains				
Attachment/Belonging	.17	-.04	-.08	.01
Self-Confidence/Coherence	.16	-.06	-.04	.21*
Acceptance/Mindfulness	.18	-.02	.00	.12
Compassion/Emotional Fulfilment	.03	-.09	-.28**	.03

Note: *p<.01; ** p<.05;

Finally, Table 8 describes the correlational analysis between all dispositional traits and contextual states and cognitive flexibility based on significant scores of the Wisconsin Card Sorting Test (WCTS, Berg, 1946) for the Portuguese population (Faustino, Oliveira & lopes, 2020). Only individuals who scored higher than 100 trials in the Nº of trials index were selected (higher level of dysfunctionality). As expected, maladaptive variables correlated positively with cognitive inflexibility/inefficient indexes and negatively with cognitive flexibility/efficient indexes. As examples, symptomatology correlated positively with nº of trials ($r = .66$ $p <.05$), nº of total errors ($r = .61$ $p <.05$), nº of perseverative responses ($r = .71$ $p <.05$), and negatively with conceptual level responses ($r = -.51$, $p <.01$) and finished categories ($r = -.68$, $p <.01$) – see table 8.

Table 8. Spearman correlations between personality domains and Wisconsin Card Sorting Test Indexes (N= 19).

	Cognitive Inflexibility - Inefficient Indexes				Conceptual Flexibility - /Efficient Indexes		
	Nº Trials	Nº Total Errors	Nª Perseverative Responses	Nº Perseverative Errors	Correct Responses	Conceptual Level Responses	Finished Categories
Early Disorder Determinants							
Symptomatology	.66**	.61**	.71**	.68**	-.21	-.51*	-.68**
Early Complex Trauma	.37	.26	.12	.07	.05	.05	-.33
Parenting Styles	.20	.39	.36	.38	-.38	-.33	-.37
Affective Temperament	.37	.48*	.48*	.52*	-.51*	-.23*	-.69**

Psychological Needs	.49*	-.28	-.39	-.33	-.16	.15	.29
Maladaptive Schemas and States							
Early Maladaptive Schemas	.34	.26	.18	.14	-.03	-.12	-.46*
Emotional Schemas	.49*	.45	.54*	.48*	-.14	-.33	-.55*
Interpersonal Schemas	.38	.20	.24	.19	.05	-.18	-.42
States of Mind	.52*	.27	.38	.33	-.02	-.24	-.44
Defenses and Critical Consequences							
Defensive Styes	.46*	.51*	.35	.43	-.07	-.18	-.36
Coping Strategies	.59**	.41	.42	.40	-.08	-.34	-.63**
Dysfunctional Interpersonal Cycles	.32	.41	.23	.20	-.06	-.11	-.40
Emotion Processing Difficulties	.63**	.45	.43	.38	-.02	-.26	-.52*
Mental Skills and Processes							
Metacognition	-.30	-.35	-.37	-.33	.09	.14	.26
Psychological inflexibility	.51*	.28	.30	.24	.07	-.23	-.45
Cognitive Reappraisal	-.26	-.03	-.16	-.12	-.09	.08	.13
Experiential Suppression	.29	.04	.11	.09	-.03	-.03	-.11
Adaptative Self Domains							
Attachment/Belonging	-.27	-.16	-.27	-.19	.01	.23	.42
Self-Confidence/Coherence	-.53*	-.18	-.26	-.22	-.24	.04	.31
Acceptance/Mindfulness	-.45	-.33	-.35	-.39	-.05	.16	.32
Compassion/Emotional Fulfilment	.07	.42	.33	.36	-.50*	-.38	-.15

Note: *p<.01; ** p<.05;

Discussion

The research aims of the third study were achieved. The exploration of relationships of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains with several neurocognitive variables was performed adequately. As described before, the correlational patterns were not entirely coherent with theory, which was expected. There were only a few correlations between operationalized constructs (self-reported vs performance-based), which also was expected. Nevertheless, some considerations can be stated.

Hypothesis one received partial confirmation. Some early disorder determinants were associated with neurocognition. Essentially, symptomatology was negatively

correlated with cognitive flexibility, inhibition and delayed perception. Affective temperament was positively correlated with deficits in cognitive flexibility, sematic and phonetic errors. Despite there being few associations, these results provide partial support to the construct of the neurocognitive psychological syndrome, which postulates that deficits in aberrant nodes between the frontal-parietal executive network (FPEN), salience network (SN), amygdaloid-hippocampal memory network (AHMN), and default mode-network (DMN) account for a substantial amount of neurocognitive symptomatology (Faustino, 2021¸ Menon, 2010). Moreover, this result also shows that affective temperament is associated with executive functions and verbal processes, which opens up some avenues when it comes to reframing the neurocognitive psychological syndrome within a developmental perspective. Another important aspect is the positive association between the regulation of psychological needs and cognitive flexibility, inhibition, learning score and immediate perception. According to Vasco and colleagues (2018), attending to emotions is a core feature of understanding the degree of regulation of each specific need. It is the emotional experience that informs the degree of regulation. Moreover, Faustino and Vasco (2020a) found that cognitive fusion (which is a form of psychological inflexibility) was significantly associated with the regulation of psychological needs. In another study, Faustino and Vasco (2020b) documented that cognitive fusion was a significant mediator of the relationship between early maladaptive schemas and the regulation of psychological needs. Also, Faustino (2020a) showed that self-reported psychological inflexibility is associated with difficulties on emotion regulation. Taken together, these evidences show that executive functions may contribute, to some extent, to the regulation of psychological needs. Moreover, the correlation between psychological needs and learning score may be interpreted as reflecting the

importance of the ability to learn, to development new adaptive ways to regulate needs, which is strongly associated with psychological flexibility.

Hypothesis two received partial confirmation. Several maladaptive schemas and states of mind correlated with impairments in cognitive flexibility and all correlated with inhibition. This supports the notion that maladaptive schemas are mental structures that encompass previous dysfunctional experiences and the associated dysfunctional affect and that these schemas are activated automatically, due to trigger stimuli. Therefore, the lack of inhibition of a preponderant response allows schema activation with all associated distressful elements. Thus, this is in line with previous theorization of the integration of schematic functioning with information processing theory and with the SAS model (Norman &Shallice, 1998) and the NPS (Faustino, 2021). Thus, early maladaptive schemas and interpersonal schemas correlated with sustained attention, which suggests inflexibility on the attentional focus based on the schematic triggering stressful stimuli, emotional consequences and mental chain reactions.

Hypothesis three received partial confirmation. Defensive styles, coping strategies and emotional processing difficulties correlated with deficits in cognitive flexibility and inhibition. This mirrors the previous explanation. Based on previous theorizations, defensive styles, coping strategies and processing difficulties may be regarded as maintenance factors of maladaptive schemas (Young et al., 2003; Faustino & Vasco, 2020c). In this sense, they can also be described as schema-driven patterns which are activated when schemas are activated. Therefore, there is a degree of inflexibility on the concomitant activation of schemas and defensive maneuvers.

Hypothesis four received partial confirmation. Psychological inflexibility correlated positively with sustained attention, immediate perception and correlated negatively with inhibition and delayed perception, which is consistent with the previous

explanation. Psychological inflexibility may be viewed as a widespread mental feature associated with different psychological and neurocognitive processes with special implication for mental health (Faustino & Vasco, 2020a; Hayes et al., 2013; Kashdan, & Rottenberg, 2010). Cognitive reappraisal correlated negatively with sustained attention which is theoretically compatible. Individuals need to be able to alternate and modulate attentional resources to be able to reappraise different situations. If individuals are extremely focused on one stimulus, they lack the critical distance and flexibility that is required to reappraise the stimuli valence (Adam et al., 2014).

Hypothesis five also received partial confirmation. Self-domains correlated with neurocognitive domains. Attachment/belonging correlated positively with updating/working memory, inhibition, and delayed perception. Self-confidence/coherence also correlated positively with inhibition with phonemic errors. Several theorists emphasize the role of adequate early attachment experiences in the development of executive functions and a stable sense of self (Cozolino, 2017; Young et al., 2003). Early experiences of secure attachment facilitate neuronal integration and skills development due to the emotional bond that is forged between the child and the mother, which acts as a basis for and holding environment (Shore, 2003). This is thought to be trait-like acquisitions. However, these results also show that these associations may be captured in the form of contextual states, as measured by the States of Mind Questionnaire (Faustino et al., 2020b). Therefore, these results may support these theoretical assumptions.

Hypothesis six also received confirmation. Maladaptive psychological variables are associated with cognitive inflexibility, while adaptive psychological variables are associated with cognitive flexibility. Despite not being surprising, these results speak volumes when it comes to considering the lack of convergence issue raised before, related

with self-report and performance tests. These strong associations only emerged with individuals who had lower performances in the WCST. This result may imply that the relationships between cognitive flexibility/inflexibility and other psychological domains may be conceptualized in terms of dimensionality. Maybe it is at the extremes of a continuum that these associations emerge as statistically and probably as clinically significant. It is also important to emphasize that cognitive inflexibility was associated with almost all defenses and critical consequences, which supports the notion of the rigidity of the defensive maneuvers that individuals use to block corrective experiences (Young et al., 2003; Faustino & Vasco, 2020c). Moreover, these results are aligned with previous theoretical assumptions (Beck, et a., 2003; Dimaggio et al., 2015; Faustino, 2020; Faustino et al., 2020b; Faustino & Vasco, 2020a,b,c; Freud, 1923; Greenberg & Goldman, 2017; Young et al., 2003).

Finally, despite these associations, there were also several variables that did not correlate, despite being theoretically coherent. For instance, if schemas may be conceptualized as structures in memory, it may be expected that maladaptive schemas are associated with all memory processes. However, this was not the case. As stated before, this may be due to: (1) incongruences in measurement of single versus repeated performance; (2) differences between typical and maximum performance; (3) differences between construct expressions and (4) differences in construct expression through performance-based tasks and self-report instruments (Saunders et a., 2018; Wennerhold & Friese, 2020). Nevertheless, these results largely support the proposed theoretical model of the articulation of dispositional traits, contextual states and neurocognition.

Limitations and Future Directions

Some limitations may be described. Data was acquired with self-reported instruments, which are limited to participants' self-awareness on the given constructs. Self-reported responses were provided on-line, without a presential supervision of the main researcher. Neuropsychological assessments were conducted in different parts of the day, based on the participants' availability, which may have some impacts on their cognitive performance. The exploration of the associations between neurocognitive domains and personality domains was based on specific indexes and not on the total scores that each assessment instrument provides, such as response times. Therefore, some correlations were not listed in the present study. The sample under study had much more female responders that males, which could have introduced biases in the results. Some individuals were engaged in psychotherapy, which may also have contributed to mixed results. However, this will be further explored. Finally, this study was conducted with university participants who configured a non-clinical sample.

Conclusions

The aims of the third study were achieved. Several associations between early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains and several neurocognitive variables were found. Results suggest that there are multiple associations between dysfunctional and functional personality patterns and domains that are related with neurocognition, especially with executive functions. Therefore, based on these preliminary results, this model adopts these core relationships between personality and neurocognition as foundations for case conceptualization and

clinical decision-making. However, more research is required to deepen and replicate these findings.

Study 4 - Relationships between subliminal affective processing and dispositional traits and contextual states

Relationships between subliminal affective processing and dispositional traits and contextual states

Abstract

Previous research showed that bottom-up automatic affective processing is correlated with different aspects of personality, which supports the assumption that there are relationships between emotions and personality traits. The present study aims to explore the associations between nonconscious affective processing (induced by subliminal emotion stimulation) and dispositional states and contextual states, defined in the present work as early disorder determinants, schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains. A subsample with clinical criteria individuals (*N*=17) was analyzed in a cross-sectional design. Individuals responded to self-report instruments and conducted a behavioral task with Electroencephalography (EEG and ERPs). Results showed strong correlations between maladaptive schematic functioning, coping responses, emotional processing difficulties, and expressive suppression with behavioral responses. Dispositional traits and contextual states seem to be associated with affective processing, especially when it comes to the neutral valence of the subliminal stimuli. The neutral priming elicits a negative reaction (dislike) as if the neutral stimuli were distorted to fit schema driven interpretations. ERPs waveforms showed an amplitude modulation with a temporal progression: in the first 100 msec the waveform amplitude was highest to the negative condition; Later on, in the time windows after 350 msec, the neutral condition was the one that elicited the ERPs' heist amplitude. These indexes a cascade of reactions, first a priority to nonconscious negative stimulation; and after that, a later processing phase of affective-cognitive interpretation (350msc) in which neutral stimuli acquire a meaning according to schemas.

Introduction

The universality of emotions for human socialization processes is well established in the literature and may be one of the major driving forces for human development and evolution (Buss, 2012; Ekman et al., 1969; Panksepp, 2010; LeDoux, 2012). Thus, adaptive human experiences are a core aspect in establishing secure attachments with significant others, which is a major cornerstone of mental health (Greenberg, 2015; Cozolino, 2017; Siegel, 2012; Shore, 2003). In this sense, humans are specialized in processing emotional reactions from others, which is consistent with early evolutionary adaptive purposes. The relationships between automatic affective processing and personality domains have been consistently reported in the scientific literature (Baião, 2018; Critchley et al., 2002; Etkin et al., 2004; Killgore & Yurgelun-Todd, 2004; Liddell et al., 2005; Rauch et al., 2000; Sheline et al., 2001), especially with manipulation of attention to subliminal processing of affective visual stimuli (Wiens, 2006). Despite this research, relationships between subliminal affective processing and clinical variables, such as schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains have not yet been explored.

Relationships between dispositional traits, contextual states, and subliminal affective processing

The relevance of early disorder determinants, schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains to case conceptualization and clinical decision-making has been consistently reported in the literature in recent years (Barreira, 2016; Castelo Branco, 2016; Faustino 2020; Faustino et al. 2020a,b,c; Faustino & Vasco, 2020 a,b,c,d; 2021; Faustino et al., 2019a; Martins, 2016). However, the relationships between these variables

and subliminal affective processing remain unexplored, which opens space for theoretical speculation and hypothesis building.

As stated in the first section of the present doctoral proposal, complex emotional systems interact with each other through a complex of neurobiological and environmental pressures which help to shape the way in which humans learn to experience and express emotional reactions (Cozolino, 2017; Ekman et al., 1969; LeDoux, 2012; Panksepp, 2005; 2011). The impacts of these interactions can be described at several levels/domains of personality organization. Lewis (2000) emphasized that the articulation between emotions and personality is intrinsically dynamic and may be viewed as self-organizing systems of interdependent processes of different levels of analysis (e.g., macroscopic and microscopic level), combined with complex hierarchical patterns. Also, Lewis (2000) described that emotional phenomena can be accommodated, according to time parameters, in continuous scales of Microdevelopment, Mesodevelopment and Macrodevelopment, which may be related to dispositional states and contextual states.

It has been conceptualized that schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains are developmental aspects of personality and have temporal stability (Cámara & Calvete, 2012; Kirchner et al., 2010; Stallard, 2007). The dialectical and continued activations between emotion and cognition from an early age (microdevelopment) is assumed to be a core process in the development of maladaptive schemas and defensive maneuvers as individuals make meaning of dysfunctional emotional experiences. Therefore, the stabilization of these structures may lead to continuous interaction between structural cognitive and affective structures (e.g., cortico-limbic structures), which crystallize throughout time (mesodevelopment). The final stage of the self-organization of complex structures, is the full-blown cognitive-affective processing systems that interpret and

assign meaning to the events and emotional experiences (macrodevelopment). In this sense, through early age, the repetition of several experiences shapes neuronal structures and complex networks that underly the development of the maladaptive schematic functioning and defensive maneuvers. As they are developed at an early age, individuals are not aware that these cognitive-affective structures are responsible for the way in which information is processed. Thus, these structures, which are outside of consciousness, tend to shape thought processes and perception, which is why those individuals tend to engage in several emotional biases in the decision-making process (Wiens, 2006).

Evidence of subliminal affective reactions has been previously described in fMRI studies (Critchley et al., 2002; Etkin et al., 2004; Killgore & Yurgelun-Todd, 2004; Liddell et al., 2005; Rauch et al., 2000; Sheline et al., 2001) and using the event-related potential methodology (ERPs), measured by electroencephalography (Etkin et al., 2005; Grawe, 2007; Kandel, 1998; Olofsson et al., 2008; Poucinho et al., 2004; Sousa et al., 2005). A recent study based on the manipulation of attention of subliminal processing of affective visual stimuli, using event-related potentials (ERPs), which is a paradigm similar to that used in the present doctoral thesis, is described below.

Baião (2018) used an experimental task with a subliminal emotional priming paradigm (backward and forward masking) to modulate the non-conscious emotions in the processing of emotionally neutral stimuli (masks). The behavioral verbal responses (liking or disliking) to the masks associated respectively to each emotion condition, positive, negative and neutral, and ERP waveforms for these three-emotion priming were recorded. These indicators were related to the scores of self-report questionnaires such as: Emotional Regulation Difficulty Scale (EDRE), Toronto Alexithymia Scale (TAS-20), Perceived Stress Scale (ESP), Adult Attachment Scale (EVA), Memphis Temperament Assessment, Pisa, Paris, and San-Diego Auto-questionnaire (TEMPS-A)

and Personality Scales of Affective Neuroscience (ANPS). Results showed that the condition of negative subliminal stimulation was the one that elicited the highest number of approach (liking) responses. This approach reaction was elicited by the more activating nonconscious condition. The positive condition was the one that triggered the highest frequency of dislike responses. Also, significant differences in the ERP waveforms at latencies up to 650 ms, with negative emotional priming triggering higher amplitudes of the ERP, were found. In a later latency (800 - 900 ms), the ERP amplitude was higher for the neutral condition (Baião, 2018).

The correlational data was also interesting. According to Baião (2018), values in the ESP and the subscales Anxiety and FEAR revealed a negative correlation with the disliking in the condition to the negative priming. The Anxiety subscale still showed a positive correlation with the choices of liking the negative condition. Finally, the EVA´s trust in others subscale showed a negative correlation with liking the negative condition. It was concluded that correlational data showed a predominance of an approach to the negative emotion priming and also avoidance responses to the positive condition in the dimensions referring to negative affect, which was interpreted as reflecting an automatic attentional bias, which leads to the unconscious departure from positive stimulation, and approach to the negative observed in depressive and anxious affects.

Therefore, based on these results it is expected that early disorder determinants, schematic functioning, and defensive maneuvers and dysfunctional consequences would correlate negatively with the approach to the positive emotional priming and positively with negative emotional priming. The inverse pattern is expected for mental abilities and processes and adaptive self-domains, where it is expected that these variables correlate positively with approach to positive priming and avoidance of negative priming (an

exception should be made for expressive suppression and psychological inflexibility, as they are measured inversely).

Research Issues and Hypotheses

Based on the previous theorizations, it is possible to explore the associations between early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains and behavioral indicators of subliminal affective processing. In this sense, the following hypotheses arise:

H1: Early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences are positively correlated with approach responses (liking) to the negative priming condition.

H2: Early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences are negatively correlated with avoidance reactions (disliking) to the negative priming condition.

H3: Mental skills, processes and adaptive self-domains are negatively correlated with approach (liking) to the negative subliminal priming condition.

H4: Mental skills, processes and adaptive self-domains are positively correlated with avoidance (disliking) to the negative priming condition.

H5: Priming conditions were significant modulators of the EEG waveforms since early and later time latency.

H6: The stimulus intrinsic motivational value – the valence conditions, positive and negative - will elicit an ERP waveform with a higher amplitude than the neutral condition (early time latency).

Methods

Participants

The sample consisted of 17 participants, all females (100%), with an age range between 18 and 27 years old (M=20.76, SD=2.88). All participants had secondary education (100%) and were Portuguese (100%) The frequencies and percentages distribution of the sample regarding the marital status is as follows: 16 (94.1%) were single and 1 (5.9%) was in a nonmarital partnership. All participants were engaged in psychotherapy with several self-reported diagnoses, being major depression (n=3, 16.9%) and depression and anxiety (n=2, 11.8%) the most prevalent – see table 1 for details.

Table 1. Descriptive statistics of the sample under study (N=17)

		Frequencies and Percentages
N		17 (100%)
Age		
	M	20.76
	SD	2.88
	Minimum	18
	Maximum	27
Gender		
	Female	17 (100%)
Nationality		
	Portuguese	17 (100%)
Scholarship		
	12º year	17 (100%)

Marital Status		
	Single	16 (94.1%)
	Nonmarital partnership	1 (5.9%)
Psychotherapy		
	Yes	17 (100%)
Self-reported diagnosis		
	Major Depression	3 (16.9%)
	Depression and Anxiety	2 (11.8%)
	Depression and Anorexia Nervosa	2 (11.8%)
	Feeding Compulsion Disorder	1 (5.9%)
	Panic Disorder	1 (5.9%)
	Obsessive Compulsive Disorder	1 (5.9%)
	Unspecified	7 (41.2%)

Self-Report Instruments

In this study, self-report questionnaires and neuropsychological instruments were used. The instruments are described above in the section *methodology* of the present doctoral proposal. Internal consistency and instruments scores are detailed in table 2. Based on previous theorizations, several self-report questionnaires were used to assess *early disorder determinants*. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein, et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-autoquestionnaire version (TEMPS-A, Akiskal, et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et a., 2012) was used. Finally,

to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess ***maladaptive schematic functioning and states of mind.*** To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Leahy Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ, Faustino Vasco, Dimaggio, Silva & Seromenho, 2021b) was used.

To assess ***defensive maneuvers and critical consequences,*** different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28 (DSQ, Saint-Martin, Valls, Rousseau, Callahan & Chabrol, 2013, Portuguese version by Martins, 2016) was used. To assess coping strategies, the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth & Pokorny 1999, revised Portuguese version by Martins, 22016) was used. Finally, to assess emotional processing difficulties, the Emotional Processing Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, in press) was used.

Mental skills and processes were assessed with different self-report measures. Metacognition were assessed with a combined score from the Metacognitive Self-Assessment Scale (MSAS, Pedone, et al., 2017, Portuguese version by Faustino et al, 2019b). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders, et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório &

Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009) was used. Finally, to assess *adaptive self-states*, the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

Bottom-up emotional processing was studied in non-conscious emotional priming with the behavioral and electrophysiological indicators described above in the methodology section.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020, and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality was assured. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. A bonification was given to each participant who completed the entire battery. The inclusion criteria were being over 18 and below 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder. This sub-clinical sample was selected through BSI criteria (>1.7) and/or self-reported diagnosis. These participants performed an experimental task with EEG measurement (See details in the second section – methodology - of the present doctoral proposal). This research was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

This present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used for sample exploration. Brown (2006) skewness values should vary between -3 and $+3$ and kurtosis values between -10 to $+10$

to be adequate. Skewness and kurtosis were acceptable. Normal distribution was not assumed (N < 30), and a 95% confidence interval was assumed with a *p*-value of .05 – Values below .055 were considered significant (Pallant, 2007). To explore the association between constructs, Pearson correlations and ANOVA with Greenhouse Geisser Correction for sphericity violations were used. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

The following section details the statistical analysis that was performed to test the study hypotheses and research aims. Descriptive statistics, such as internal consistency, means, and standard deviations, are described in table 2.

Table 2. Descriptive statistics of the psychological variables under study.

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.54	2.30	.26	1.89	2.86	.51	-.17
Affective Temperament (TEMPS-A)	.83	1.41	.12	1.21	1.56	-.32	-.13
Parenting Styles (YPI)	.92	2.78	.48	1.78	3.56	-.20	-.11
Psychological Needs (NSRS-43)	.89	5.39	.78	3.81	6.58	-.18	-.60
Symptomatology (BSI-53)	.96	1.69	.72	.49	2.75	-.36	-1.07
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.75	.69	1.38	4.02	-.24	.01
Emotional Schemas (LSS-50)	.84	3.27	.48	2.39	4.08	-.09	-.65
Interpersonal Schemas (IIP-32)	.87	1.68	.50	.97	2.69	.26	-.49
States of Mind (SMQ)	.94	3.06	.70	1.52	4.45	-.46	.92
Defenses and Critical Consequences							
Defensive Styes (DSQ-28)	.74	4.72	.82	.07	6.11	-.21	-.49
Coping Strategies (Coping index of SMQ)	.94	3.59	.92	1.60	5.13	-.58	.13
Dysfunctional Interpersonal Cycles (IRPQ)	.83	2.97	.29	2.32	3.46	-.46	.15
Emotion Processing Difficulties (EPDS-R)	.90	2.87	.57	1.68	4.00	.24	.73
Mental Skills and Processes							
Metacognition (MSASS)	.45	4.06	.35	3.34	4.82	-.03	.71

Psychological inflexibility (CFQ)	.92	4.55	1.40	2.14	6.57	-.31	-.02
Cognitive Reappraisal (ERQ)	.74	4.72	1.34	2.33	6.83	-.32	-.74
Experiential Suppression (ERQ)	.54	4.07	1.16	1.75	5.75	-.64	-.29
Adaptative Self Domains						
Attachment/Belonging (SMQ)	.62	3.56	1.12	2.25	5.75	.79	-.20
Self-Confidence/Coherence (SMQ)	.50	3.90	1.00	2.50	5.75	.22	-1.04
Acceptance/Mindfulness (SMQ)	.51	3.10	.88	1.00	4.75	-.28	1.13
Compassion/Emotional Fulfilment (SMQ)	.85	3.53	1.25	2.00	5.50	.36	-1.37

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Pearson correlations between personality domains and behavioral pleasure responses are described in table 3. Early maladaptive schemas correlated negatively with like-neutral (r = -.57, p <.01) and with like neutral score (r = -.60, p <.01). Emotional schemas correlated negatively with like-neutral (r = -.53, p <.01) and with like neutral score (r = -.61, p <.05). States of mind correlated negatively with like-neutral (r = -.48, p <.01) and with like neutral score (r = -.56, p <.01).

Table 3. Pearson correlations between personality domains and behavioral pleasure responses (N= 17).

	Behavioral Reactions					
	Like Positive	Like Negative	Like Neutral	Like Positive Score	Like Negative Score	Like Neutral Score
Early Disorder Determinants						
Symptomatology	.04	.37	-.39	-.02	.37	-.48
Early Complex Trauma	.01	-.26	.25	-.21	-.14	.29
Parenting Styles	.36	.06	-.43	.38	.12	-.44
Affective Temperament	-.13	-.07	.20	-.12	.06	.22
Psychological Needs	.02	-.20	.17	-.01	-.15	.33
Maladaptive Schemas and States						
Early Maladaptive Schemas	.26	.33	-.57*	.37	.36	-.60*
Emotional Schemas	.37	.17	-.53*	.44	.14	-.61**
Interpersonal Schemas	.21	.17	-.38	.26	.13	-.48
States of Mind	.18	.32	-.48*	.20	.35	-.56*

	Dislike Positive	Dislike Negative	Dislike Neutral	Dislike Positive Score	Dislike Negative Score	Dislike Neutral Score
Defenses and Critical Consequences						
Defensive Styles	.11	.25	-.35	.02	.26	-.24
Coping Strategies	.19	.39	.55*	.17	.37	-.59*
Dysfunctional Interpersonal Cycles	.27	-.28	-.01	.37	-.30	-.09
Emotion Processing Difficulties	.03	.54*	-.54*	.12	.53*	-.59*
Mental Skills and Processes						
Metacognition	.03	-.07	.03	-.05	.02	.10
Psychological inflexibility	-.03	.38	-.33	-.14	.30	-.46
Cognitive Reappraisal	.07	-.23	.15	.14	-.07	.25
Experiential Suppression	.29	.23	-.51*	.33	.23	-.39
Adaptive Self Domains						
Attachment/Belonging	-.27	-.12	.39	-.19	-.10	.55*
Self-Confidence/Coherence	-.04	-.25	.28	.07	-.26	.38
Acceptance/Mindfulness	-.06	-.13	.18	.07	-.04	.33
Compassion/Emotional Fulfilment	-.06	-.05	.11	.03	-.09	.27

Note: *p<.01; ** p<.05;

Pearson correlations between personality domains and behavioral displeasure responses are described in table 4. Early maladaptive schemas correlated positively with dislike neutral ($r = .72$, $p <.05$) and with dislike neutral score ($r = .66$, $p <.01$). States of mind correlated positively with dislike neutral ($r = .53$, $p <.01$) and with dislike neutral score ($r = .52$, p $<.01$).

Table 4. Pearson correlations between personality domains and behavioral displeasure responses (N= 17).

	Behavioral Reactions					
	Dislike Positive	Dislike Negative	Dislike Neutral	Dislike Positive Score	Dislike Negative Score	Dislike Neutral Score
Early Disorder Determinants						
Symptomatology	-.09	-.22	.34	-.12	-.27	.29
Early Complex Trauma	-.04	.31	-.30	-.03	.08	-.36
Parenting Styles	-.35	-.09	.48	-.28	-.15	.30
Affective Temperament	-.14	-.04	.20	.19	-.03	.11
Psychological Needs	.09	.14	-.26	.04	.12	-.40
Maladaptive Schemas and States						
Early Maladaptive Schemas	-.40	-.25	.72**	-.36	-.23	.66**
Emotional Schemas	-.16	-.20	.40	-.20	-.18	.41

Interpersonal Schemas	-.20	-.28	.52*	-.30	-.20	.48
States of Mind	-.33	-.15	.53*	-.27	-.22	.52*
Defenses and Critical Consequences						
Defensive Styes	-.08	-.36	.49*	-.07	-.48	.37
Coping Strategies	-.30	-.12	.46	-.28	-.20	.46
Dysfunctional Interpersonal Cycles	-.45	.25	.21	-.31	.29	.22
Emotion Processing Difficulties	-.18	-.35	.58*	-.29	-.40	.56*
Mental Skills and Processes						
Metacognition	.11	.12	-.25	.13	.03	-.48
Psychological inflexibility	.05	-.27	.25	-.09	-.35	.14
Cognitive Reappraisal	-.20	.28	-.09	-.28	.24	-.16
Experiential Suppression	-.48	.09	.43	-.33	.08	.52*
Adaptative Self Domains						
Attachment/Belonging	.25	.14	-.43	.19	.18	-.37
Self-Confidence/Coherence	.05	.11	-.19	-.06	.20	-.23
Acceptance/Mindfulness	.09	-.08	-.01	.11	.07	-.09
Compassion/Emotional Fulfilment	.17	.11	-.31	-.02	.24	-.35

Note: *p<.01; ** p<.05;

Electrophysiological Data: Event Related Potentials (ERP)

ERP waveforms were obtained as described above and were compared between the three emotion priming conditions. Only the significant results in ANOVA repeated measures with emotion condition as within subjects factor are reported.

Table 5 shows the ERP waveforms and ANOVA in the time window 100 to 150 milliseconds. In the Left Frontal Lead (F5), ANOVA was not significant, $F(2;28)=1.137$, $p >.05$ ns. However, the pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.05$). In the Right Frontal Lead (F6), ANOVA was not significant, $F(1.328; 18.591)=1.940$, $p >.05$ ns; with Greenhouse Geisser Correction for sphericity violations). Pairwise comparisons between negative and neutral priming showed a higher amplitude to negative priming ($p =.03$). In the Right Fronto Central (FC6), ANOVA was not significant, $F(1.981; 27.734)=2.118$, p >.05 ns;

with Greenhouse Geisser Correction for sphericity violations). However, the pairwise comparisons between negative and positive priming showed a higher amplitude to negative priming ($p = .04$).

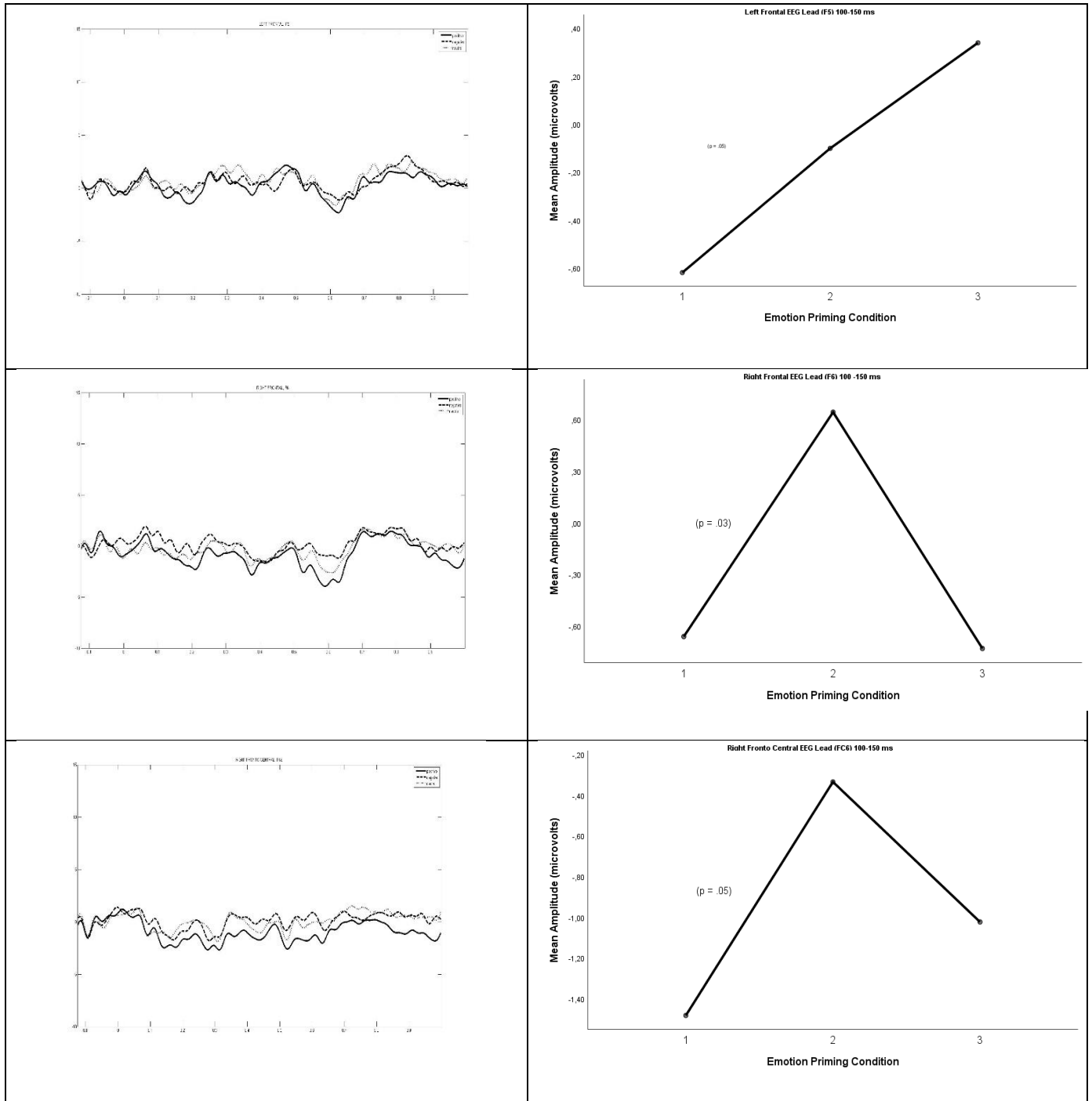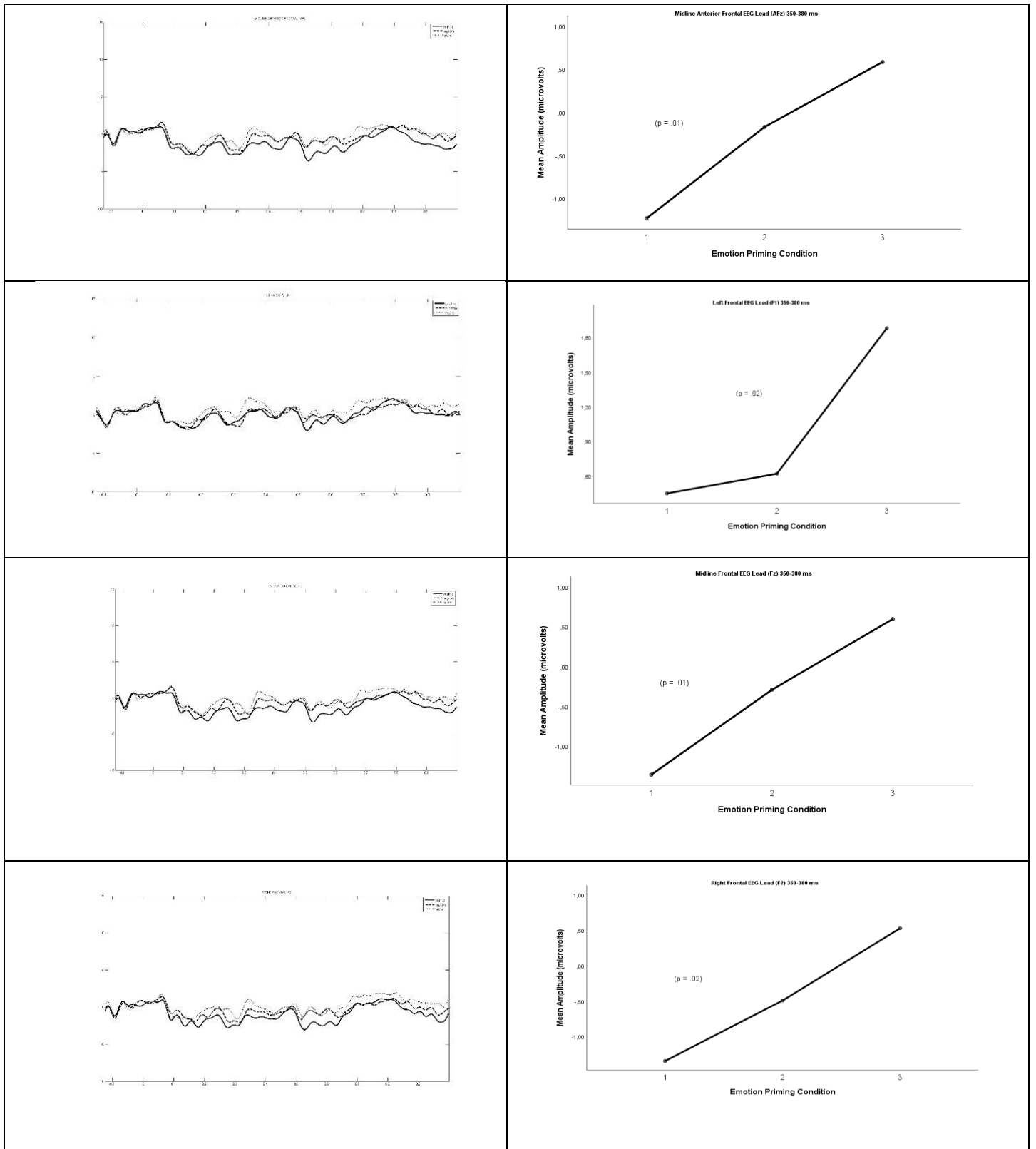*Table 5. ERP Waveforms and ANOVA in Time window 100 to 150 milliseconds.*

Table 6 shows the ERP waveforms and ANOVA in the time window 350 to380 milliseconds. In the Midline Anterior Frontal EEG Lead (AFz), ANOVA was significant, $F(2;28)=3.883$, $p =.03$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.01$). In the Left Frontal EEG Lead (F1), ANOVA was not significant, $F(1.696; 23.747)=2.809$, $p >.05$ ns; with Greenhouse Geisser Correction for sphericity violations). However, the pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.02$). In the Midline Frontal EEG Lead (Fz), ANOVA was significant, $F(2;28)=4.711$, $p =.02$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.01$). In the Right Frontal EEG Lead (F2), ANOVA was significant, $F(2;28)=4.711$, $p =.02$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p = .02$). In the Right Frontal EEG Lead (F4), ANOVA was significant, $F(2;28)=3.225$, $p =.05$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming (p =.04). In the Right Fronto Central EEG Lead (FC2), ANOVA was significant, $F(2;28)=4.411$, $p =.02$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.02$). In the Right Fronto Central EEG Lead (FC6) ANOVA was significant, $F(2;28)=4.209$, $p =.02$. Pairwise comparisons between positive, negative and neutral priming showed a higher amplitude to negative and neutral priming ($p =.02$).

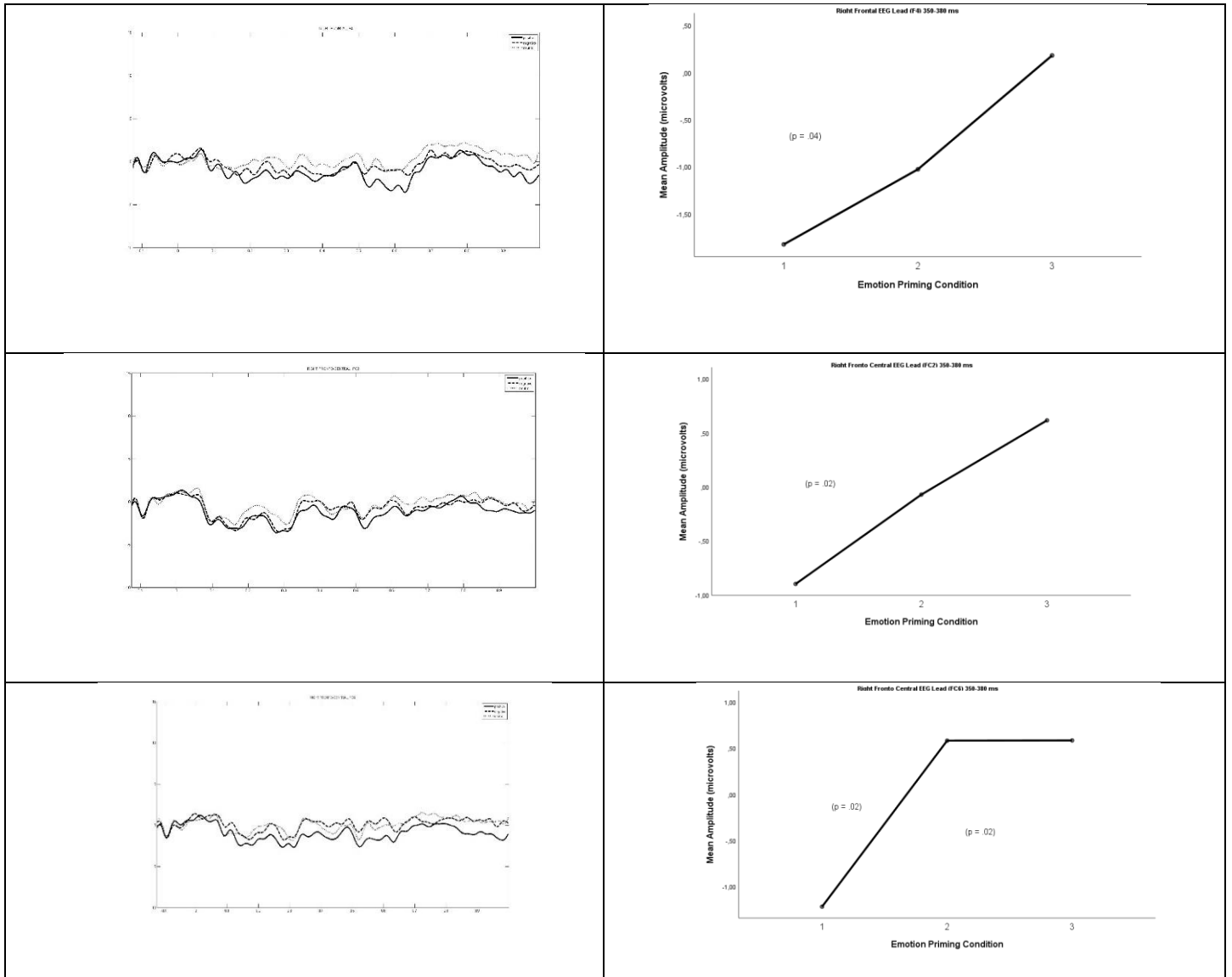*Table 6. ERP Waveforms and ANOVA in Time window 350 to 380 milliseconds.*

Table 7 shows the ERP waveforms and ANOVA in the time window 440 to 3510 milliseconds. In the Right Fronto Central EEG Lead (FC6), ANOVA was significant, $F(2;28)=3.008$, $p <.05$. Pairwise comparisons between positive and negative priming showed a higher amplitude to negative priming ($p =.01$). In the Right Parietal EEG Lead (P6), ANOVA was significant, $F(2;28)=2,447$, $p <.05$. Pairwise comparisons between positive and neutral priming showed a higher amplitude to neutral priming ($p =.01$).

Table 7. ERP Waveforms and ANOVA in Time window 440 to 510 milliseconds.
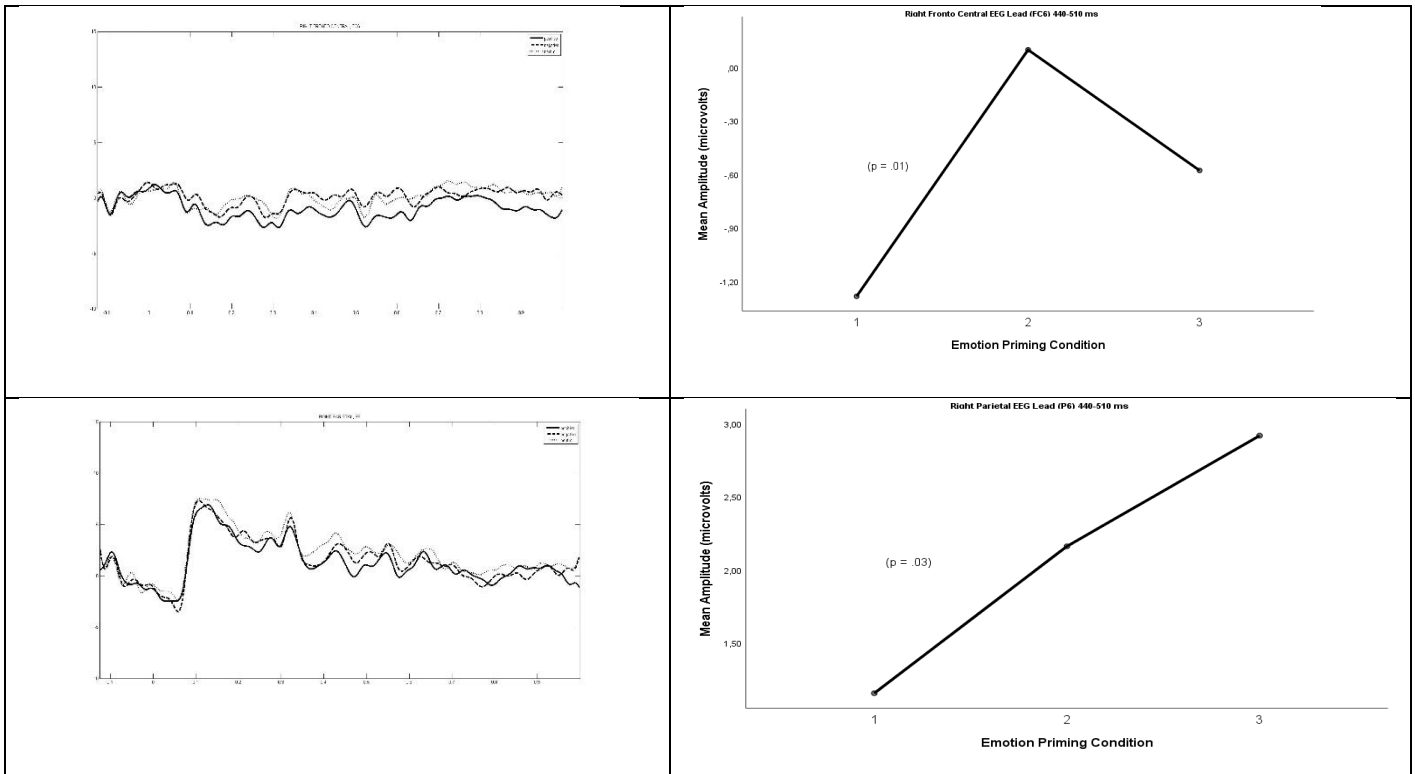
Discussion

The aims of the present study were achieved. The associations between bottom-up automatic affective processing and dispositional states and contextual states, defined in the present work as early disorder determinants, schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains, were explored. Therefore, some considerations may be described.

Our first two hypotheses (**hypothesis one and two),** which described an automatic reaction of approach and avoidance to conditions congruent with maladaptive schemas, was not observed. Instead, maladaptive schematic functioning and states of mind were negatively correlated with approach to neutral valence and its respective degree. This is somewhat consistent with the notion that individuals who have developed severe

maladaptive schematic functioning and states of mind have implicit biases towards negative evaluation of stimuli in ambiguity conditions, such as in neutral priming.

This pattern was consistent with early maladaptive schemas, emotional schemas and states of mind. Only interpersonal schemas did not correlate with any behavior indicator. However, this makes sense, because interpersonal schemas are focused on interpersonal relationships, whereas the subliminal stimuli were developed to elicit emotional responses. In this sense, it seems that these individuals manifest implicit negative biases towards neutral stimuli because maladaptive schematic functioning represents maladaptive learnings that prompt negative judgments and attributions to neutral stimuli. Individuals interpret negatively neutral stimuli, which is consistent with previous findings (Olofsson et al., 2008; Schupp et al., 2006).

Furthermore, the same pattern was found with coping mechanisms, emotion processing difficulties and expressive suppression, which may also be due to a bias in the automatic allocation of processes, which selectively excludes the processing of information with positive valence (Baião, 2018; Bernardes, 2017). Moreover, these results may also suggest an interaction between low level automatic emotion reactions and structural variables such that dispositional traits and contextual states are indeed a consequence of previous experiences but can also change these experiences, which shaped and modulated regulated gene expression, which in turn modulated activating neuronal plasticity in several neural networks involved in affective processing since early phases of epigenetic development in adulthood. As stated before, early maladaptive schemas are embedded in cortico-cortical and cortico-subcortical networks involved in threat detection (Young et al., 2003; LeDoux, 2012). In this sense, coping mechanisms and expressive suppression are the defensive maneuvers that individuals use to avoid the activation of those schemas. Thus, correlations with emotional processing difficulties

were also expected because it reflects intrinsic emotional experiences that are laden with suffering expressing a negative perceptive bias. However, early disorder determinants were not correlated with any behavioral indicator (pleasure or displeasure), which means that, probably, the maladaptive learnings that stem from those early determinates (e.g., trauma, parenting styles) are the ones which must influence non-conscious emotional processing.

Hypothesis three received very poor support and **hypothesis four** was not confirmed. Only the self-domain of attachment and belonging/interpersonal safeness was correlated positively with a neutral degree, which may be viewed as the counterpart of the previous explanation. Individuals with recurring states of mind of attachment and belonging/interpersonal safeness may be able to evaluate neutral stimuli without automatic negativity bias. However, only this adaptive self-domain received empirical support. One likely explanation may be due to sub-sample features. This subsample represents a clinical sub-sample, which means that there is great intensity, magnitude and inflexibility of dysfunctional variables. It is expected that individuals in clinical sub-samples manifest higher degrees of dysfunctional variables than individuals in non-clinical subsamples. In this sense, dysfunctional variables may overshadow the adaptive variables, which means that adaptive variables may be reduced in intensity, domains and behavioral indicators. Nevertheless, this hypothesis received very poor empirical support.

Hypothesis five was accepted. Priming conditions were significant modulators of the EEG waveforms since early and later time latency. The ERP response was used to index the temporal course of the cascade of emotion reactions which influenced the modulation of ERPs waveforms amplitude in time and distributed in more Anterior EEG leads the first 100 ms after stimuli onset where negative valence priming condition elicited the highest ERP amplitude. This was a very regular response observed in Right

and Frontal EEG leads. In a later time, 350ms-380ms the highest ERP waveform was for neutral priming in the Frontal and Right hemisphere. In the left hemisphere neutral priming elicited the highest waveform in the Left Frontal EEG lead. Later on, in 440ms-510ms the highest amplitude was for the negative priming in the Right Frontal EEG lead and highest neutral priming for the Right Parietal EEG lead. We interpreted these amplitude and scalp topography of the ERP waveforms pattern as indexing an automatic effect of emotion on orientation and activation in the first time window and later on the influence on cognitive processing, resulting from maladaptive schematic inference.

Hypothesis six was not confirmed. The valence conditions, positive and negative, did not elicit an ERP waveform with a higher amplitude than the neutral condition (early time latency). Thus, in the vast majority of the cases it was the opposite, where the neutral priming elicit the higher ERP waveform. One likely explanation may be due to schematic inference and perceptual organization. Deeply rooted schemas shapes the way individuals perceive and judge internal and external experience by assigning dysfunctional attributions to stimuli (Young et all, 2003). Therefore, maladaptive schemas assign schematic inferences to the neutral stimuli which is why that the neutral priming elicit higher amplitudes.

Limitations and Future Directions

Some limitations may be described. Data acquisition used with self-report instruments, which are limited to participants' self-awareness on the given constructs. Self-report answers were conduct on-line, without the presential supervision of the main researcher. The sample size ($N = 17$) is small and heterogeneous which limits generalizations and extrapolations of the results. In the future, it would be interesting to explore a systemic analysis of automatic emotional reactions through multilevel

346

modeling. Also, it would be interesting to explore these relationships in clinical samples that are more narrowly defined.

Conclusions

The aims of the fourth study were achieved. The exploration of the relationships between affective nonconscious processing with dispositional states and contextual states, defined in the present work as early disorder determinants, schematic functioning, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains, was performed adequately. These results suggest a close systemic relationship between maladaptive schematic functioning, defensive maneuvers, emotional processing difficulties, and subliminal affective processing.

Study 5 - Comparisons between clinical and non-clinical subsamples on core psychological domains

Comparisons between clinical and non-clinical subsamples on core psychological domains

Abstract

The exploration of disorder-specific and dimensional clinically relevant variables is ongoing. Several diagnostic and transdiagnostic variables have already been identified; however, there is still a considerable path to uncover. In the fifth study of this doctoral thesis, the diagnostic and/or transdiagnostic potential of the main theories are explored. The fifth study explores whether early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains are similar or different in two subsamples divided by the Brief Symptom Inventory (BSI-53) clinical criteria (<.17), stablished for the Portuguese population. The total sample (*N*=644) was divided into a low-symptoms (non-clinical) subsample and a high-symptoms (clinical) subsample. T-tests were used to compare mean values. Results showed that only early complex trauma and expressive suppression were not statistically different in the two subsamples. Individuals in the low-symptoms sub-sample reported less symptoms, lower levels of maladaptive schematic functioning, defensive maneuvers and psychological inflexibility than individuals in the higher-symptoms subsample. Also, they reported higher levels of adaptive self-states than the individuals in the higher-symptoms subsample. The variables under study emerged as clinically significant in the present study.

Introduction

The exploration of diagnostic and transdiagnostic variables is underway (Faustino, 2020), and it is a cornerstone of the model under study. Transtheoretical and transdiagnostic variables seem to increase the explained variance of the psychotherapeutic outcome (Lambert & Barley; 2002; Goldfried, 2019; Newby, et al., 2015; Norcross & Goldfried, 2005; Norcross & Wampold, 2018, 2019). However, conclusions about each specification are still a matter of debate, which opens a wide space for scientific research. Therefore, this fifth study of the present doctoral proposal is focused on the exploration of differences in mean values of early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains, regarding two subsamples, divided by Brief Symptom Inventory (BSI-53) clinical criteria (>.17). Here, I will briefly summarize the empirical findings that support hypothesis development, data analysis and discussion.

Comparisons between low-symptoms (non-clinical) vs high-symptoms (clinical) groups

Previous studies showed the potential transdiagnostic value of several variables under study, especially when it comes to maladaptive schematic functioning, defensive maneuvers and mental abilities and processes. Several recent studies focused specifically on the exploration of mean differences in non-clinical and clinical variables (Almeida, 2016; Barreira, 2016; Castelo-Branco, 2016; Faustino, 2020; Ferreira, 2020; Fonseca, 2012; Gonçalves, 2020; Sol & Vasco, 2017). In this study, to differentiate between higher-order categories by research findings is complex, because each study may have focused on several variables without the conceptual structure suggested in the present

work. All these studies were explored with Pearson correlations and t-tests comparisons for mean values in self-reported questionnaires for independent samples. The questionnaires in these revised studies are the same that were used in the present doctoral proposal.

In a recent study, differences in mean values in early maladaptive schemas, psychological inflexibility and interpersonal relational cycles and psychological needs in a non-clinical and clinical sample were explored (Almeida, 2016). It was found that individuals in the non-clinical sample reported lower levels of early maladaptive schemas, psychological inflexibility and interpersonal dysfunctional cycles than individuals in the clinical sample. Also, individuals in the non-clinical sample reported higher values in the regulation of psychological needs than individuals in the clinical sample (Almeida, 2016). In a similar study, Fonseca (2012) found differences in the presence of early maladaptive schemas, comparing a non-clinical and clinical sample. These results showed that early maladaptive schemas are clinically relevant variables and may have a potential diagnostic value. Thus, the transdiagnostic value of this construct recently has been emphasized in the literature (Faustino & Vasco, 2020a,b,c,d; Faustino & Vasco, 2021).

Barreira (2016) and Castelo Branco (2016) described differences in mean values in emotional processing difficulties and emotion regulation difficulties and the regulation of psychological needs, comparing a non-clinical and clinical sample. They documented that individuals in the non-clinical sample revealed lower levels of emotional processing difficulties and emotion regulation difficulties, and higher levels of the regulation of psychological needs, than individuals in the clinical sample. Faustino (2020) also emphasized the potential transdiagnostic value of psychological inflexibility and emotional dysregulation: correlations between cognitive fusion and emotional dysregulation domains were found independently of diagnosis and clinical criteria. Thus,

psychological inflexibility is one of the strongest candidates to be definitively defined as a transtheoretical and transdiagnostic variable (Aldao et al., 2010; Hayes et al., 2011; Kashdan & Rottenberg, 2010; Morris & Mansell, 2018).

In the same study, Faustino (2020) explored whether the presence of emotion regulation strategies of cognitive reappraisal and expressive suppression differed between clinical and non-clinical samples. It was found that individuals in the non-clinical sample reported lower levels of cognitive reappraisal and higher levels of expressive suppression that individuals in the clinical sample. However, mean values in expressive suppression did not differ statistically between the two samples. According to these results, individuals use this regulatory strategy independently of clinical criteria, which means that suppression may be adaptive, if contextually based (Aldao et al., 2010; Faustino, 2020; Webb et al., 2012).

Martins (2016), through a logistic regression, found that, on the one hand, the higher the psychological inflexibility level and neurotic defenses, the greater the probability of the individual belonging to the clinical sample, and on the other hand, the higher the level of satisfaction level of regulation of psychological needs and self-affirmation in the subject's response to likelihood of the individual belonging to the clinical sample.

Faustino and collaborators (2021b) showed that states of mind differ across individuals regarding higher or lower symptomatology. On the one hand, vulnerable, suffered, or fragile states and coping states of mind were more severe in a high-symptoms sample that in a low-symptoms sample; On the other hand; adaptive self-states (e.g., attachment/belonging, self-confidence/coherence) were higher in a low-symptoms sample than in a high-symptoms sample.

Gonçalves (2020) also found that adaptive schematic modes (a concept similar to states of mind) were statistically higher in a non-clinical sample than in a clinical sample. In the same study, it is described that individuals in the non-clinical sample had higher metacognitive abilities and skills than individuals in the clinical sample.

Research Issues and Hypothesis

Based on the previous theorization, the following hypotheses are listed:

H1: Individuals in the high-symptoms sub-sample have higher levels of early disorder determinants than individuals in the low-symptoms sub-sample (except for psychological needs, which is reversed);

H2: Individuals in the high-symptoms sub-sample have higher levels of maladaptive schematic functioning and states of mind than individuals in the low-symptoms sub-sample;

H3: Individuals in the high-symptoms sub-sample have higher levels of defensive maneuvers and dysfunctional consequences than individuals in the low-symptoms sub-sample;

H4: Individuals in the high-symptoms sub-sample have lower levels of mental abilities and processes than individuals in the low-symptoms sub-sample (except for psychological inflexibility, which is reversed);

H5: Individuals in the high-symptoms sub-sample have lower levels of adaptive self-domains than individuals in the low-symptoms sub-sample;

Methods

Participants

The total sample consisted of 644 participants, 100 males (15.5%) and 544 females (84.5%), with an age range between 18 and 63 years old (M=20.68, SD=5.53). Age of education frequencies were as follows: 577 (89.6%) with the 12th year, 45 (7.0%) with a bachelor's degree, 20 (3.1%) with a master's degree, and 2 (.3%) with a doctoral degree. Almost all of the sample was Portuguese 609 (93.5%), and some were Brazilian 32 (3.9%). The frequencies and percentages distribution of the sample regarding the marital status is as follows: 614 (95.3%) were single, 19 (3.0%) were married, 7 (1.1%) were in nonmarital partnership, and 4 (.4%) were divorced. One hundred and twenty-three individuals (19.1%) were engaged in psychotherapy with several self-reported diagnoses, being generalized anxiety disorder (n=11, 2.2%), major depression (n=8, 1.6%), and depression and anxiety (n=7, 1.4%) the most prevalent. The sample was divided by self-report diagnosis which allowed having two different subsamples (low symptoms *n*= 521 and high-symptoms *n*=123). – see table 1 for details.

Table 1. Descriptive statistics of the low-symptoms and high-symptoms subsamples.

		Low-symptoms subsample	High-symptoms subsample
N		521	123 (100%)
Age			
	M	20.68	20.80
	SD	5.53	5.28

	Minimum	18	18
	Maximum	63	57
Gender			
	Male	100 (15.5%)	15 (12.2%)
	Female	544 (84.5%)	108 (87.8%)
Nationality			
	Portuguese	609 (93.5%)	111 (90.2%)
	Brazilian	32 (3.9%)	11 (9.0%)
	Mozambican	6 (1.1%)	1 (.8%)
	Cabo-Verdean	2 (.4%)	
	Other	6 (1.1%)	
Scholarship			
	12º year	577 (89.6%)	119 (96.7%)
	Bachelor's degree	45 (7.0%)	1 (.8%)
	Master's degree	20 (3.1%)	1 (.8%)
	Doctoral degree	2 (.3%)	2 (1.6%)
Marital Status			
	Single	614 (95.3%)	123 (100%)
	Married	19 (3.0%)	0 (0%)
	Nonmarital partnership	7 (1.1%)	
	Divorced	4 (.4%)	
Psychotherapy			
	Yes	0 (0%)	123 (19.1%)
	No	521 (80.9%)	0 (0%)
Self-reported diagnosis			
	Generalized Anxiety Disorder		11 (2.2%)
	Major Depression		8 (1.6%)
	Depression and Anxiety		7 (1.4%)
	Panic Disorder		4 (.8%)
	Social Anxiety		1 (.2%)
	Anorexia Nervosa		3 (.6%)
	Co-morbid personality disorders		4 (.8%)
	Unspecified		8 (1.6%).

Self-Report Instruments

In this study, self-report questionnaires were used. To see instruments specific details, see the previous section – *methodology* - of the present doctoral proposal. Internal consistency and instruments scores are detailed in table 2.

Based on previous theorizations, several self-report questionnaires were used to assess *early disorder determinants*. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of Memphis, Pisa, Paris and San Diego-autoquestionnaire version (TEMPS-A, Akiskal et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et a., 2012) was used. Finally, to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess *maladaptive schematic functioning and states of mind.* To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Lehay Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020d) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

To assess ***defensive maneuvers and critical consequences,*** different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28 (DSQ, Saint-Martin, Valls, Rousseau, Callahan & Chabrol, 2013, revised Portuguese version by Martins, 2016) was used. To assess coping strategies, the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth &Pokorny 1999, revised Portuguese version by Martins, 2016) was used. Finally, to assess emotional processing difficulties, the Emotional Processing Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, in pres) was used.

Mental skills and processes were assessed with different self-report measures. Metacognition was evaluated with the Metacognitive Self-Assessment Scale (MSAS, Pedone et al., 2017, Portuguese version by Faustino et al., 2019a). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório & Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009) was use.

Finally, to assess ***adaptive self-states***, the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020, and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality assured. To have a valid participation, individuals had to complete a

battery of self-report questionnaires in the online Qualtrics platform. A bonification was given to each participant who completed the entire battery. The inclusion criteria were being over 18 and below 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder. This research was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

The present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used for sample exploration. Brown (2006) skewness values should vary between −3 and +3 and kurtosis values between −10 to +10 to be adequate. Skewness and kurtosis were acceptable. Normal distribution was assumed (N > 30) and a 95% confidence interval was assumed with a p-value of .05 (Pallant, 2007). To explore differences in mean values t-test for independent samples were used. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

The following section details the statistical analyses that were performed to test the study hypothesis and research aims. Descriptive statistics, such as internal consistency, means and standard deviations, for the non-clinical sample are described in table 2.

Table 2. Descriptive statistics of the psychological variables in the non-clinical subsample (N=521).

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.91	2.03	.73	1.25	3.39	.52	-1.48
Affective Temperament (TEMPS-A)	.77	2.32	.42	.00	1.79	-.87	10.02
Parenting Styles (YPI)	.92	1.34	.16	1.40	4.03	.80	.85
Psychological Needs (NSRS-43)	.88	5.79	.76	.00	1.68	.18	-1.02
Symptomatology (BSI-53)	.93	.82	.43	3.26	7.40	-.51	.06

Maladaptive Schemas and States of Mind

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Maladaptive Schemas (YSQ-S3)	.95	2.34	.57	1.00	4.70	.40	.09
Emotional Schemas (LSS-50)	.86	2.90	.47	1.47	4.49	.38	-.03
Interpersonal Schemas (IIP-32)	.82	1,28	.40	.41	2.50	.41	-.22
States of Mind (SMQ)	.92	2.41	.55	1.06	4.14	.38	-.02

Defenses and Critical Consequences

Defensive Styes (DSQ-29)	.61	4.31	.71	2.43	6.32	.08	-.21
Coping Strategies (Coping index of SMQ)	.87	2.78	.68	1.17	4.77	.19	-.19
Dysfunctional Interpersonal Cycles (IRPQ)	.83	2.87	.28	1.97	3.79	-.27	.61
Emotion Processing Difficulties (EPDS-R)	.89	2.39	.54	1.18	3.91	.00	-.29

Mental Skills and Processes

Metacognition (MSAS)	.75	4.16	.34	3.01	4.95	-.33	.02
Psychological inflexibility (CFQ)	.90	3.35	1.28	1.00	6.86	.21	-.57
Cognitive Reappraisal (ERQ)	.82	4.72	1.10	1.33	7.00	-.41	.12
Experiential Suppression (ERQ)	.73	4.01	1.15	1.00	7.00	-.17	-.32

Adaptative Self Domains

Attachment/Belonging (SMQ)	.48	4.23	.59	1.42	4.81	-.03	-.27
Self-Confidence/Coherence (SMQ)	.43	4.08	.61	2.50	5.75	-.26	-.25
Acceptance/Mindfulness (SMQ)	.18	3.31	.72	2.00	6.00	-.45	.43
Compassion/Emotional Fulfilment (SMQ)	.50	3.68	.78	1.00	5.75	.26	-.02

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Descriptive statistics, such as internal consistency, means and standard deviations, for the clinical sample are described in table 3.

Table 3. Descriptive statistics of the psychological variables in the clinical subsample (N=123)

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.91	2.12	.63	1.25	3.32	.86	-.69
Affective Temperament (TEMPS-A)	.80	2.61	.45	1.10	1.77	-.30	-.34
Parenting Styles (YPI)	.93	1.52	.14	1.40	3.81	.27	-.32
Psychological Needs (NSRS-43)	.90	4.70	.83	1.47	3.28	.81	-.02
Symptomatology (BSI-53)	.96	2.16	.39	2.88	6.88	.07	-.19

Maladaptive Schemas and States of Mind

Early Maladaptive Schemas (YSQ-S3)	.96	3.31	.57	2.08	4.69	.12	-.72
Emotional Schemas (LSS-50)	.88	3.54	.50	2.22	4.86	-.23	.05
Interpersonal Schemas (IIP-32)	.87	1.80	.40	.97	2.69	-.12	-.70
States of Mind (SMQ)	.94	3.46	.53	1.99	4.63	-.11	-.19

Defenses and Critical Consequences

Defensive Styes (DSQ-29)	.65	4.75	.70	2.89	6.68	-.12	-.27
Coping Strategies (Coping index of SMQ)	.90	3.97	.60	2.23	5.13	-.23	-.21
Dysfunctional Interpersonal Cycles (IRPQ)	.83	2.94	.29	2.10	3.67	-.09	.40
Emotion Processing Difficulties (EPDS-R)	.90	3.18	.45	2.00	4.68	.43	.70

Mental Skills and Processes

Metacognition (MSAS)	.72	4.04	.39	2.98	4.82	-.31	-.45
Psychological inflexibility (CFQ)	.92	5,26	1.05	2.71	7.00	-.25	-.85
Cognitive Reappraisal (ERQ)	.78	4.25	1.24	1.50	7.00	-.21	-.58
Experiential Suppression (ERQ)	.75	4.12	1.19	1.00	6.75	-.19	-.28

Adaptative Self Domains

Attachment/Belonging (SMQ)	.58	3.49	.68	1.31	3.96	.17	-.08
Self-Confidence/Coherence (SMQ)	.27	3.46	.66	2.00	5.00	.16	-.66
Acceptance/Mindfulness (SMQ)	.16	3.00	.70	1.50	5.00	-.26	.39
Compassion/Emotional Fulfilment (SMQ)	.49	2.76	.71	1.50	5.00	.03	-.46

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

T-test for independent samples

A *t*-test for independent samples was used to test hypotheses under study. Comparing the low-symptoms subsample and the high-symptoms subsample, symptomatology, early maladaptive schemas, emotional schemas, interpersonal schemas, states of mind, defensive styles, coping strategies, metacognition and mentalization, psychological inflexibility, experiential suppression, attachment/belonging, acceptance/mindfulness and compassion/emotional fulfilment emerged as statistically different(*p* <.01). Only parenting styles and expressive suppression were not statistically different. All maladaptive variables mean scores were higher in the clinical sample than

in the non-clinical sample, whereas adaptive variables mean scores were higher in the

non-clinical sample than clinical sample – see table 4.

Table 4. T-test for independent samples for comparing nonclinical (N=521) and clinical (N=123) subsamples.

	Low-symptoms subsample		High-symptoms subsample		t-test	
	Mean	(SD)	Mean	(SD)	t	*p***
Early Disorder Determinants						
Early Complex Trauma	2.03	.73	2.12	.63	1.200	.23
Parenting Styles	2.32	.42	2.61	.45	-6.854	.01
Affective Temperament	1.34	.16	1.52	.14	-11.374	.01
Psychological Needs	5.79	.76	4.70	.83	1.200	.01
Symptomatology	.82	.43	2.16	.39	-31.522	.01
Maladaptive Schemas and States						
Early Maladaptive Schemas	2.34	.57	3.31	.57	13.914	.01
Emotional Schemas	2.90	.47	3.54	.50	-17.027	.01
Interpersonal Schemas	1.28	.40	1.80	.40	-13.172	.01
States of Mind	2.41	.55	3.46	.53	-12.986	.01
Defenses and Critical Consequences						
Defensive Styes	4.31	.71	4.75	.70	-6.239	.01
Coping Strategies	2.78	.68	3.97	.60	-17.765	.01
Dysfunctional Interpersonal Cycles	2.87	.28	2.94	.29	-2.539	.01
Emotion Processing Difficulties	2.39	.54	3.18	.45	-14.987	.01
Mental Skills and Processes						
Metacognition and Mentalization	4.16	.34	4.04	.39	3.572	.01
Psychological inflexibility	3.35	1.28	5.26	1.05	-15.301	.01
Cognitive Reappraisal	4.72	1.10	4.25	1.24	4.160	.01
Expressive Suppression	4.01	1.15	4.12	1.19	-0.908	.36
Adaptative Self Domains						
Attachment/Belonging	4.23	.59	3.49	.68	12.142	.01
Self-Confidence/Coherence	4.08	.61	3.46	.66	10.051	.01
Acceptance/Mindfulness	3.31	.72	3.00	.70	4.378	.01
Compassion/Emotional Fulfilment	3.68	.78	2.76	.71	11.921	.01

*Note: **p<0.001*

Both subsamples were analysed separately to test the hypotheses under study.

Hierarchical regression analysis and Pearson correlations were used. Results are as

follows.

Analysis of non-clinical subsample (low symptoms)

Table 5, describes a hierarchical stepwise regression analysis that explored relative weights of all variables under study in the explanation of the variance of symptomatology. States of mind, early maladaptive schemas, emotional schemas, affective temperament, emotional processing difficulties, cognitive reappraisal and self-confidence/coherence were the best predictors of symptomatology – seven predictors (R^2 = .46, b = -.62, $p <. 05$).

Table 5. Hierarquical stepwise regression analysis of variables understudy with symptomatology as a dependent variable in the non-clinical sample (N=521).

	B	Error	Beta	t	sig	Tolerance	VIF
States of Mind	.28	.04	.36	6.61	.00	.34	2.92
Early Maladaptive Schemas	.09	.04	.12	2.25	.02	.34	2.93
Emotional Schemas	.05	.03	.055	1.28	.20	.56	1.76
Affective Temperament	.25	.09	.09	2.54	.01	.82	1.21
Emotional Processing Difficulties	.16	.03	.20	4.41	.01	.49	2.02
Cognitive Reappraisal	-.03	.01	-.09	-2.89	.01	.97	1.02
Self-Confidence/Coherence	.02	.07	2.02	.04	.69	1.43	.05

Note: (R^2 = .46, b = -.62, $p <. 05$).

Correlations between maladaptive schematic functioning and states of mind and early disorders determinants were explored. Overall, identified correlations followed previous assumptions. For instance, early maladaptive schemas correlated positively with symptomatology (r = .58, p <.05), early complex trauma (r = .13, p <.05), affective temperament (r = .39, p <.05) and parenting styles (r = .32, p <.05), and correlated negatively with psychological needs (r = -.59, p <.05) – see table 6.

Table 6. Pearson correlations between schematic functioning and states of mind, and early disorder determinants in non-clinical sample (N=521).

	Symptomatology	Psychological Needs	Early Complex Trauma	Affective Temperament	Parenting Styles Total
Early Maladaptive Schemas	.58**	-.56**	.13**	.39**	.32**

Emotional Schemas	.44**	-.30**	.06	.34**	.29**
Interpersonal Schemas	.45**	-.50**	.06	.32**	.30**
States of Mind	.63**	-.56**	.07	.35**	.31**

*Note: **p<.05; *p<.01*

Correlations between maladaptive schematic functioning and states of mind and defensive maneuvers were explored. Overall, identified correlations followed previous assumptions. For instance, early maladaptive schemas correlated positively with coping strategies ($r = .72$, $p <.05$), emotional processing difficulties ($r = .66$, $p <.05$), defensive styles ($r = .27$, $p <.05$) and relational cycles ($r = .14$, $p <.05$). Emotional schemas correlated positively with coping strategies ($r = .51$, $p <.05$), emotional processing difficulties ($r = .55$, $p <.05$), defensive styles ($r = .34$, $p <.05$) and relational cycles ($r = .22$, $p <.05$) – see table 7.

Table 7. Pearson correlations between maladaptive schematic functioning and states of mind, and defensive maneuvers and critical consequences in the non-clinical sample (N=521).

	Coping Mechanism	Emotional Processing Difficulties	Defensive Styles	Relational Cycles
Early Maladaptive Schemas	.74**	66**	.27**	.14**
Emotional Schemas	.51**	.55**	.34**	.22**
Interpersonal Schemas	.50**	.53**	.22**	.14**
States of Mind	.94**	.67**	.27**	.16**

*Note: **p<.05; *p<.01*

Table 8 shows the analysis of correlation between maladaptive schematic functioning and states of mind and mental skills and processes in the non-clinical sample. Overall, identified correlations followed previous assumptions. Early maladaptive schemas correlated positively with psychological inflexibility ($r = .61$, $p <.05$) and expressive suppression ($r = .35$, $p <.05$), and negatively with metacognition and mentalization ($r = -.29$, $p <.05$) and with cognitive reappraisal ($r = -.11$, $p <.05$). States of mind followed the same pattern, with positive correlations with psychological inflexibility ($r = .61$, $p <.05$) and expressive suppression ($r = .29$, $p <.05$), and negative

correlation with metacognition and mentalization ($r = -.26$, $p <.05$) and cognitive

reappraisal ($r = -.10$, $p <.05$) – see table 7.

Table 8. Pearson correlations between maladaptive schematic functioning and states of mind, and mental skills and processes in the non-clinical sample (N=522).

	Metacognition	Psychological Inflexibility	Cognitive Reappraisal	Expressive Supression
Early Maladaptive Schemas	-.29**	.61**	-.11**	.35**
Emotional Schemas	-.22**	.51**	.05	.26**
Interpersonal Schemas	-.33**	.48**	-.16**	.21**
States of Mind	-.26**	.61**	-.10*	.29**

Note: **p<.05; *p<.01

Finally, correlations between maladaptive schematic functioning and states of

mind and adaptive self-domains in moment one were also explored. Overall, identified

correlations followed previous assumptions. As examples, early maladaptive schemas

correlated negatively with attachment /interpersonal safeness ($r = -.41$, $p <.05$), trust and

integrity/assertiveness ($r = -.40$, $p <.05$), acceptance /mindfulness ($r = -.21$, $p <.05$) and

compassion/emotional fulfillment ($r = -.45$, $p <.05$). Interpersonal schemas correlated

negatively with attachment /interpersonal safeness ($r = -.33$, $p <.05$), trust and

integrity/assertiveness ($r = -.28$, $p <.05$), acceptance /mindfulness ($r = -.08$, $p <.05$) and

compassion/emotional fulfillment ($r = -.36$, $p <.05$) – see table 9.

Table 9. Pearson correlations between, maladaptive schematic functioning and states of mind, and adaptive self-domains in the non-clinical sample (N=521).

	Attachment and Belonging	Self-Confidence and Coherence	Acceptance and Mindfulness	Compassion and Emotional Fulfilment
Early Maladaptive Schemas	-.41**	-.40**	-.21**	-.45**
Emotional Schemas	-.29**	-.37**	-.15**	-.32**
Interpersonal Schemas	-.33**	-.28**	-.08*	-.36**
States of Mind	-.53**	-.52**	-.40**	-.62**

Note: **p<.05; *p<.01

Analysis of the clinical subsample (high symptoms)

Table 10, describes a hierarchical stepwise regression analysis that explored relative weights of all variables under study in the explanation of the variance of symptomatology. Early maladaptive schemas, states of mind, emotional processing difficulties, psychological inflexibility and self-confidence/coherence were the best predictors of symptomatology – five predictors ($b = .68$, $R^2 = .49$, $p<. 05$).

Table 10. Hierarquical stepwise regression analysis of variables under study with symptomatology as a dependent variable in the clinical sample (N=123).

	B	Error	Beta	t	sig	Tolerance	VIF
States of Mind	.07	.07	.10	1.08	.27	.42	2.37
Early Maladaptive Schemas	.05	.07	.07	.73	.46	.41	2.42
Emotional Processing Difficulties	.30	.08	.35	3.72	.01	.49	2.03
Psychological Inflexibility	.07	.03	.20	2.41	.01	.59	1.69
Self-Confidence/Coherence	-.09	.04	-.15	-2.09	.03	.71	1.40

Correlations between maladaptive schematic functioning and states of mind and early disorders determinants were explored. Overall, identified correlations followed previous assumptions, but with less significant correlations. For instance, early maladaptive schemas correlated positively with symptomatology ($r = .53$, $p <.05$) and affective temperament ($r = .36$, $p <.05$), and correlated negatively with psychological needs ($r = -.52$, $p <.05$). Emotional schemas correlated positively with symptomatology ($r = .28$, $p <.05$) and affective temperament ($r = .34$, $p <.05$), and correlated negatively with psychological needs ($r = -.28$, $p <.05$). Early complex trauma did not correlate with any variable and parenting styes correlated positively only with interpersonal schemas ($r = .22$, $p <.05$) – see table 11.

Table 11. Pearson correlations between schematic functioning and states of mind, and early disorder determinants in non-clinical sample (N=123).

	Symptomatology	Psychological Needs	Early Complex Trauma	Affective Temperament	Parenting Styles Total
Early Maladaptive Schemas	.53**	-.52**	-.10	.36**	.16
Emotional Schemas	.28**	-.28**	-.06	.34**	.08
Interpersonal Schemas	.31**	-.36**	-.02	.28**	.27**
States of Mind	.52**	-.52**	-.07	.26**	.17

*Note: **p<.05; *p<.01*

Correlations between maladaptive schematic functioning and states of mind and defensive maneuvers were explored. Overall, identified correlations followed previous assumptions, but with less significant correlations. For instance, early maladaptive schemas correlated positively with coping strategies (*r* = .57, *p* <.05) and emotional processing difficulties (*r* = .60, *p* <.05), but did not correlate with defensive styles and relational cycles. Emotional schemas correlated positively with coping strategies (*r* = .32, *p* <.05), emotional processing difficulties (*r* = .37, *p* <.05) and defensive styles (*r* = .34, *p* <.05) but did not correlated with relational cycles. Thus, relational cycles did not correlate with any variable – see table 12.

Table 12. Pearson correlations between maladaptive schematic functioning and states of mind, and defensive maneuvers and critical consequences in the non-clinical sample (N=123).

	Coping Mechanism	Emotional Processing Difficulties	Defensive Styles	Relational Cycles
Early Maladaptive Schemas	.57**	.60**	.10	.05
Emotional Schemas	.32**	.37**	.23**	.15
Interpersonal Schemas	.47**	.36**	.04	.15
States of Mind	.87**	55**	.10	-.02

*Note: **p<.05; *p<.01*

Table 13 shows analysis of correlations between maladaptive schematic functioning and states of mind and mental skills and processes in the clinical sample. Overall, identified correlations followed previous assumptions, but with less significant correlations. Early maladaptive schemas correlated positively with psychological

inflexibility ($r = .48$, $p <.05$) and expressive suppression ($r = .33$, $p <.05$), and negatively with cognitive reappraisal ($r = -.19$, $p <.05$), but it did not metacognition and mentalization. States of mind followed a similar pattern, with a positive correlation with psychological inflexibility ($r = .34$, $p <.05$) and a negative correlation with cognitive reappraisal ($r = -.10$, $p <.05$), but it did not correlate with metacognition and mentalization and expressive suppression – see table 13.

Table 13. Pearson correlations between maladaptive schematic functioning and states of mind, and mental skills and processes in the non-clinical sample (N=123).

	Metacognition	Psychological Inflexibility	Cognitive Reappraisal	Expressive Supression
Early Maladaptive Schemas	-.15	.48**	-.19*	.33**
Emotional Schemas	-.25**	.34**	.04	.38**
Interpersonal Schemas	-.22*	.21*	-.11	.07
States of Mind	-.10	.48**	-.24**	.15

*Note: **p<.05; *p<.01*

Finally, correlations between maladaptive schematic functioning and states of mind and adaptive self-domains in moment one were also explored. Overall, identified correlations followed previous assumptions. As examples, early maladaptive schemas correlated negatively with attachment /interpersonal safeness ($r = -.45$, $p <.05$), trust and integrity/assertiveness ($r = -.42$, $p <.05$) and compassion/emotional fulfillment ($r = -.25$, $p <.05$). States of mind correlated negatively with attachment /interpersonal safeness ($r = -.50$, $p <.05$), trust and integrity/assertiveness ($r = -.46$, $p <.05$), acceptance /mindfulness ($r = -.19$, $p <.05$) and compassion/emotional fulfillment ($r = -.43$, $p <.05$). Acceptance /mindfulness correlated only with states of mind – see table 14.

Table 14. Pearson correlations between maladaptive schematic functioning and states of mind, and adaptive self-domains in the clinical sample (N=123).

	Attachment and Belonging	Self-Confidence and Coherence	Acceptance and Mindfulness	Compassion and Emotional Fulfilment
Early Maladaptive Schemas	-.45**	-42**	-.05	-.25**

Emotional Schemas	-.25**	-.33**	-.13	-.14
Interpersonal Schemas	-.37**	-.25**	-.14	-.10
States of Mind	-.50**	-.46**	-.19*	-.46**

Note: **p<.05; *p<.01

Discussion

The research aims of the fifth study were achieved. The exploration of differences between low-symptoms and high-symptoms subsamples in early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains was performed adequately. Nevertheless, some considerations can be described.

Only hypotheses **one** and **four** did not receive empirical support. The presence of early complex trauma was not statistically different between the two subsamples. This was not expected, because early complex trauma was previously associated with higher symptomatic levels in clinical samples than non-clinical samples (Dyer et al., 2017; Veronese & Pepe, 2017), and several psychological disorders (Humphreys et al., 2020; Zatti et al., 2017). Smaller differences between mean values were found, where individuals in the high-symptoms subsample showed higher values in early complex trauma than individuals in low-symptoms subsample. These differences were not statistically significant. One explanation may be given considering the transdiagnostic perspective. Maybe the presence of early complex trauma is similar in individuals with low and high symptoms, which means that early complex trauma may have poorer associations between what happened in the past and the actual maladaptive mental structures (e.g., schemas, coping strategies), and symptomatology. If this is true for symptomatology, maybe this is also true for diagnostic groups vs non-diagnostic groups. Nevertheless, early complex trauma may be viewed in a continuum, from low to middle

to severe frustration (complex trauma), which makes a precise conclusion based in the present data difficult. Therefore, more research is required to explore this issue.

Moreover, based on previous theoretical assumptions, individuals who experience early complex trauma tend to manifest more frequently several psychopathological conditions, when compared with individuals who did not experience early complex trauma (Kavanaugh et al., 2017; Sudbrack et al., 2015). However, they may not be aware of the intensity, significance or impact of those experiences in the here-and-now. Individuals who experience early complex trauma tend to develop powerful defensive styles (Freud, 1936, Vaillant, 2020), coping modes (Young et al., 2003), cognitive distortions and biases (Beck et al., 2003), which may suppress, avoid, transform, eliminate or dissociate painful memories, cognitions and images from conscious awareness, which could lead to this pattern of responses. This is consistent with previous theorizations, according to which individuals who experience early repetitive and cyclical dysfunctional experiences related to the frustration of core emotional needs (Young et al., 2003) tend to develop a set of *defensive maneuvers and critical consequences* (Faustino, in prep) that suppress, avoid, transform, eliminate or dissociate painful autobiographical experiences, which are embedded in maladaptive early schemas.

Another likely explanation may be given, regarding the sample under study. This sample was constituted by students, wherein, probably, the level of trauma-related experiences is not at a high level. Another explanation may be that individuals may defend themselves when it comes to answering a trauma-related questionnaire, and they may thus have avoided answering truly.

Hypothesis number four was not supported because expressive suppression was did not statistically differ between the two subsamples. This result may have different explanations. Expressive suppression was previously associated with psychological

symptoms (Aldao et al., 2010), emotion regulation difficulties (Faustino, 2020a) and maladaptive emotional schemas (Faustino & Vasco 2021a; Lehay, 2011), which means that this emotional regulation strategy may imply, to some extent, a degree of dysfunctionality. In this sense, it was expected that individuals in the high-symptoms subsample exhibited higher levels of expressive suppression than individuals in the low-symptoms sub-sample. However, based on previous findings, where expressive suppression was not statistically significant in a clinical and non-clinical subsample, this result was expected (Faustino, 2020a). It is the second study where expressive suppression did not differ between differ two clinical and non-clinical samples. Taken together these results may support the notion that this variable may be a candidate to be described as a transdiagnostic variable.

Some considerations may be made. Leahy et al. (2011) emphasized that expressive suppression may be adaptive in different specific situations, such as the suppression of anxiety or fear in the eminence of a death threat, car crashes or/and or a criminal situation. Also, expressive suppression may also be useful when individuals are arguing and anger, resentment or disdain increases unproductively and in an uncontrolled manner (Greenberg, 2015). Expressive suppression may also be used to inhibit uncontextualized sexual impulses towards a person who is not available to mate. In this sense, it is expected that this emotion regulation strategy may be used mundanely regardless of psychological symptomatology (Aldao et al., 2010; Faustino, 2020; Morris & Mansell, 2018).

Other hypotheses were empirically supported, and some considerations may be made. All maladaptive variables, such as affective temperament, parenting styles, maladaptive schematic functioning, defensive maneuvers, and dysfunctional consequences and psychological inflexibility had higher mean values, on the respective

questionnaires, in the high-symptoms subsample that in the low-symptoms subsample. All adaptive variables, such as psychological needs, metacognition and mentalization, cognitive reappraisal and adaptive self-states had higher mean values, on the respective questionnaires, in the low-symptoms subsample than in the high-symptoms subsample. All these mean differences were statistically significant. This implies several aspects. First, the maladaptive variables are clinically significant, because these two sub-samples were made through the cut-off clinical value (>1.7), from BSI-53. Second, these maladaptive variables (e.g., schemas, defenses, psychological inflexibility) are highly associated between themselves, as demonstrated in study two described previously, which is consistent with theoretical assumptions (Dimaggio et a., 2007; 2015; Faustino et al., 2019a,b; Faustino, 2020a,b; Faustino et al., 2020a; Faustino & Vasco 2020a,b,c; Vasco et al., 2018; Young et al., 2003). Third, these maladaptive variables are extremely associated with symptomatology (severe intensity), as showed by clinical significance of the difference between the two sub-samples, and should be considered for case conceptualization and clinical decision making. Fourth, despite statistical significance of the difference between the sub-samples, these variables were present in the two samples, which suggests that they are not exclusively associated with high symptomatology and, probably, discrete diagnosis. In this sense, these variables may have, to some extent, a functional degree of dimensionality. Fifth, adaptive self-states (e.g., self-compassion, attachment and belonging) were also present in the high-symptoms sub-sample (higher lower mean values), which means that these variables may also be relevant when it comes to symptom reduction and schema restructuring (Faustino & Vasco, 2020a,b,c). Finally, these evidences, taken together, support the transtheoretical and transdiagnostic perspective for these variables.

Limitations and Future Directions

Some limitations may be described. Data was acquired with self-reported instruments, which are limited to participants' self-awareness on the given constructs. This study was conducted on-line, without a presential supervision of the main researcher. The two subsamples under study had many more female than male responders, which could have introduced some biases in the results. Finally, this study was conducted with university participants, who configured a non-clinical sample.

Conclusions

The aims of the fifth study were achieved. Comparisons between early disorder determinants, schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains were explored in two low-symptom and high-symptoms sub-samples. Only mean values in early complex trauma and expressive suppression were not statistically different in the two sub-samples. Individuals in the high-symptoms sub-sample scored higher in maladaptive variables than individuals in the low-symptoms sub-sample. The inversed pattern was found for adaptive variables. Taken together these evidences support theoretical predictions. Nevertheless, more research is required to explore the same analysis in different samples, especially to assess which variables may also be aligned with diagnostic criteria.

Study 6 - Exploring temporal and contextual stability of maladaptive

schematic functioning and states of mind, defensive maneuvers, mental abilities,

and adaptive self-domains

Exploring temporal and contextual stability of maladaptive schematic functioning and states of mind, defensive maneuvers, mental abilities, and adaptive self-domains

Abstract

Temporal and contextual stability of maladaptive psychological functioning is directly associated with chronic emotional suffering, life-long disorders, and life dissatisfaction. It is the stability of pervasive and significant dysfunctional psychological variables associated with toxic relationships and contexts that impairs psychological change. However, the differentiation of temporal stability and their contribution over time to psychological dysfunctionality is still a matter of debate. Also, it is not clear if the relationships between these variables are the same throughout time. In this study, the temporal stability of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and adaptive self-domains is explored. A sub-sample of 53 individuals (M=24.37, SD=9.52) was assessed in two different moments with a six-month interval, with several self-reported measures. Results showed significant differences between moment one and two, with a descending pattern in mean scores of dysfunctional variables. An inverse pattern was found regarding the adaptive variables. However, mean scores of some variables, such as early maladaptive schemas, emotional schemas, psychological needs, and cognitive reappraisal, were not statistically different between moment one and two. These results seem to differentiate temporal and contextual stability in different variables which may illustrate which variables may be at the core of life-long psychological suffering, gaining primacy in psychological intervention. Implications for the overall model are discussed.

Introduction

Understanding the temporal stability of psychological suffering is an aim that guided clinical psychologists and psychotherapists in developing several disorders theories about human non-adaptation. This led to the development of notions such as precipitating and maintenance factors, which became integral elements in case conceptualizations beyond theoretical orientations (Ells, 2013; Maganavita, 2012). Different approaches postulate different mechanisms for the development and maintenance of psychological disorders, which as explained before, may lead to difficulties on the identification and definition of clear constructs. The discussion between dispositional traits and contextual states is ongoing. However, a clear differentiation, definition and articulation of these constructs was never accomplished in a satisfactory manner. In this sense, this present doctoral proposal aims to contribute to this theoretical discussion, when it comes to understanding the temporal stability and contextual salience of maladaptive schematic functioning and states of mind, defensive maneuvers, mental abilities and adaptive self-domains. Also, the exploration of these variables in relation to the systematic treatment selection variables is also explored. In this sixth study, I will briefly summarize the empirical findings that support research hypotheses, data analysis, and discussion.

Temporal stability and contextual salience of psychological variables

The discussion between dispositional traits and contextual states is one of the most important discussions about the temporal stability and contextual salience of human expressions and manifestations. The temporal stability of maladaptive psychological functioning is one of the major issues that lead individuals to psychotherapy (Faustino, 2021). This temporal stability is strongly associated with chronic emotional suffering, life-long disorders, and life dissatisfaction. From early psychoanalysis (Freud, 1931), to behavior therapy (Wolpe, 1976), to contemporary approaches such as cognitive behavior therapy (Beck et al., 2004) and schema therapy (Young et al, 2003), researchers emphasized different constructs that were assumed to be responsible for keeping life-long suffering and symptomatology. Some constructs were based on developmental frustrations and stage resolution, some were based on learning principles, some were based on psychological defenses and some were based on mental structures. According to the present doctoral proposal, it is possible that all those proposed variables/constructs have some implications to the temporal stability of psychological suffering. However, research is required to explore these theoretical claims.

Freud (1923) postulated that individuals develop life-long emotional anguish and suffering by re-experiencing unresolved unconscious conflicts of early psychosexual stages. He stated that ego-defenses were then used to keep emotionally stressful mental contents away from consciousness. However, these dysfunctional mental elements would emerge in the conscious mind in the form of a psychodynamic symptom, such as anxiety, phobias, or hysteria. Contrasting with Freud's approach, behavior theorists emphasized the notion of maladaptive learnings (e.g classical and operant conditioning, social modeling) in the acquisition and maintenance of psychological disorders and symptomatology (Bandura, 1971; Pavlov, 1927; Skinner, 1937, Watson & Rayner, 1920;

Wolpe, 1990). Cognitive theorists emphasized the notion of dysfunctional beliefs and cognitive distortions as core variables for the development and maintenance of chronic symptomatology.

Integrative theorists started to look to all these contributions and developed new contemporary approaches to understand how and why individuals develop and maintain life-long psychological disorders. Young and colleagues (2003) defined early maladaptive schemas and coping styles as the core determinants of chronic and pervasive life psychological disorders. Early maladaptive schemas encapsulate the dysfunctional emotional pain and memories that result from the frustration of core emotional needs. After suffering these early life frustrations, individuals develop specific coping styles of avoidance, surrender or overcompensation that block emotional processing and impede engagement in cognitive, emotional, behavioral and interpersonal corrective experiences that disconfirm pre-existing schema-beliefs. These schema-beliefs or thematic assumptions are also responsible for the development of emotional processing difficulties (Faustino & Vasco, 2020c) and interpersonal dysfunctional cycles (Faustino & Vasco, 2020a), which are regarded in the present work not just as critical responses but also as maintenance factors. Thus, the notion of early frustration of core emotional needs associated with the development of pervasive mental structures and the utilization of defense maneuvers may be viewed as a transtheoretical explanation which is compatible, to some extent, with other several contemporary approaches (Dimaggio et al., 2015; Lehay, 2010; Greenberg, 2015; Vasco et a., 2018), and is one of the mains assumptions of the integrative disorder theory of the present work.

Research regarding the temporal stability of early maladaptive schemas is sparse. Probably, due to their theoretical definitions, researchers and clinicians assume that these schemas are stable and enduring over time. Nevertheless, there seems to be research that

supports this assumption. Stallard (2007) explored the temporal stability of early maladaptive schemas in children in the community population. Children in the two groups were assessed in two different moments, with a 6-month interval. Significant correlations were found between different unconditional schemas (developed earlier) and conditional schemas. The subjugation schema was stable over time, which was consistent with the developmental context of children. Riso et al. (2006) explored the long-term stability of early maladaptive schemas in 55 depressed outpatients over a 2.5 to 5-year interval. They found moderate to good indexes of schema stability, even controlling for depressive symptomatology. The authors concluded that the temporal stability of schemas is compatible with the temporal stability of personality disorders, which is in line with the schema-focused approach (Young, 1999).

Wang and colleagues (2010) found significant test-retest moderate correlations between YSQ scales of Disconnection and Rejection domains and Impaired Limits domains, which were attributed to temporal stability of schemas belonging to these domains. Cámara and Calvete (2012), in a two-wave prospective study, where individuals were assessed in two different moments with 5 months of interval, found that the emotional deprivation schema predicted depressive symptomatology and the vulnerability to harm and the dependence/incompetent schema predicted anxiety symptomatology. The authors stated that early maladaptive schemas (as life-long dysfunctional mental structures) may be described as vulnerability factors in the presence of stress of events, which is in line with the content specificity hypothesis (Beck, 1976).

When it comes to the exploration of the stability of defensive styles and coping mechanisms, research is also sparse. Probably, the same researchers and clinicians may also adopt the theoretical notion that these constructs are stable. According to Moos and colleagues (2003), dispositional coping is stable over time and reflects a lifelong trait or

style and contextual coping is dependent on contextual or stressor specificities. The present study is focused on dispositional coping, but in the future, theoretical differentiation will be further elaborated. Nevertheless, Kirchner and colleagues (2010) described that avoidance coping was stable over a period of 17 months and approach coping was not in a sample of adolescents, being regarded as dispositional coping. However, mixed results regarding coping stability were previously documented, probably due to the use of different methodological approaches (Herman-Stahl, Stemmler & Petersen, 1995; Skinner & Zimmer-Gembeck, 2007).

Similar to the notion of dispositional and contextual coping, is the notion of cognitive reappraisal and expressive suppression, which are framed in the *mental abilities and processes domain* in the present study. Research shows that dispositional cognitive reappraisal is positively associated with wellbeing and negatively correlated with symptomatology (Gross & John, 2003; Aldao et al., 2010). An inverse pattern is found for suppression, whereby the contextual use of suppression is positively correlated with symptomatology and cognitive fusion (Faustino 2020) and negatively correlated with satisfaction in interpersonal relations (Srivastava et al., 2009). Thus, similar to dispositional and contextual coping evidence, mixed results are reported regarding the stability of the use of these two regulatory strategies (Aldao et al., 2010; Haines et al., 2016; Webb et al., 2012). Kobylińska and Kusev (2019) emphasized that the stability of the use of these strategies is closely associated with personality traits, stimulus salience, psychological flexibility and environmental demands. In this sense more research is required to differentiate these complex relationships.

Adaptive mental domains are thought to be one of most impactful protective factors in treatment relapse and emotional stability (Faustino et al., 2020b). The notion of the healthy self is now a widespread construct and a core factor targeted in psychotherapy

(Dimaggio et al., 2015; Gilbert, 2018; Hayes et al., 2010; Young et al., 2003). Several authors explored the temporal stability of some of the traits that can be defined as adaptive self-domains, thus adopting the disposition and contextual approach. Moreira and colleagues (2016) documented that higher levels of dispositional self-compassion and mindfulness were correlated with mindful parenting and lower levels of parenting stress and non-adaptive parenting styles. Kong, Wang and Zhao (2019) described that dispositional mindfulness predicted core self-evaluations and life satisfaction, and a path analysis supported the mediating role of core self-evaluations in the relationships between dispositional mindfulness and life satisfaction. Heshmati, and Pellerone (2019) documented that big five traits associated with dispositional mindfulness predicted alexithymia; however, after controlling big five traits at baseline, dispositional mindfulness lost its predictive value. Svenden and colleagues (2020) showed that dispositional self-compassion is associated with better psychophysiological regulation of emotional arousal beyond mindfulness. Finally, attachment patterns and/or styles tend to oscillate between trait and state dimensions but may be predictable (Gillath, Karantzas & Fraley, 2016).

This evidence showed that temporal stability of psychological constructs does follow a linear pattern. Some constructs seem to follow more enduring patterns (e.g., early maladaptive schemas), whereas other constructs seem to be more flexible and contextual (e.g., contextual coping strategies), but the trait or state approach and dispositional or contextual approach discussion is beyond the scope of this study. However, this opens several avenues for further research and supports the present research of this study and the inclusion as relevant variables in the present doctoral thesis. Also, the exploration of temporal stability of several other constructs, such as emotional schemas, mentalizations and/or emotion processing difficulties, seems to be lacking,. Another research aspect that

seems to be sparce is the exploration of the associations between these variables in two different moments. Relationships between schemas, states of mind, psychological needs; relational cycles, psychological inflexibility, mindfulness, compassion, acceptance and symptomatology were previously identified and described (Faustino 2020a,; Faustino et al. 2020a,b; Faustino & Vasco, 2020 a,b,c; Faustino et al., 2019a). However, it is not clear if these relationships have temporal stability and if these relationships maintain the same patterns.

Study hypotheses and research aims

As described previously, this work integrates early maladaptive schemas, emotional schemas, interpersonal schemas, and states of mind in the same category – *maladaptive schematic functioning and states*. It integrates defensive styles, coping strategies, dysfunctional cycles, and emotion processing difficulties in the same category - *defensive maneuvers and dysfunctional consequences*. It integrates mental abilities and processes in the same category – *mental abilities and processes*. And finally, it integrates adaptive self-domains in the same category. Therefore, based on the previous theorization the following hypotheses are listed:

H1: Symptomatology has temporal stability

H2: The regulation of psychological needs and maladaptive schematic functioning have temporal stability, except for states of mind.

H3: Defenses and critical consequences have temporal stability

H4: Mental Skills and Processes have temporal stability

H5: Adaptive self-domains (adaptive states of mind) do not have temporal stability

H6: Moment one differs from moment two regarding the variance prediction in symptomatology

H7: Moment one does not differ from moment two regarding the associations between psychological needs, maladaptive schematic functioning and states of mind, and defensive maneuvers

H8: Moment one does not differ from moment two regarding the associations between psychological needs, maladaptive schematic functioning and states of mind, and mental abilities and processes

H9: Moment one does not differ from moment two regarding the associations between psychological needs, maladaptive schematic functioning and states of mind, and adaptive self-domains

Methods

Participants

The sample consisted of 53 participants, 10 males (18.9%) and 43 females (81.1%), with an age range between 18 and 64 years old (M=24.37, SD=9.55). Years of education frequencies were as follows: 41 (77.4%) with the 12th year, 7 (13.2%) with a bachelor's degree, 4 (7.5%) with a master's degree, and 1 (1.9%) with a doctoral degree. Almost all of the sample was Portuguese 52 (98.1%). The frequencies and percentages distribution of the sample regarding the marital status is as follows: 46 (86.6%) were single, 4 (7.5%) were married, 1 (1.9%) were in nonmarital partnership and 2 (3.4%) were divorced. Twelve individuals (22.6%) were engaged in psychotherapy with self-reported diagnoses of major depression (n=2, 3.8%) and generalized anxiety disorder (n=2, 3.8%) as the most prevalent – see table 2 for details.

Table 2. Descriptive statistics of the sample under study (N=53)

		Frequencies and Percentages
N		53(100%)
Age		
	M	24.37
	SD	9.52
	Minimum	18
	Maximum	64
Gender		
	Male	10 (18.9%)
	Female	43 (81.1%)
Nationality		
	Portuguese	52 (98.1%)
	Mozambican	1 (1.9%)
Scholarship		
	12th year	41 (77.4%)
	Bachelor's degree	7 (13.2%)
	Master's degree	4 (7.5%)
	Doctoral degree	1 (1.9%)
Marital Status		
	Single	46 (86.8%)
	Married	4 (7.5%)
	Nonmarital partnership	1 (1.9%)
	Divorced	2 (3.4%)
Psychotherapy		
	Yes	12 (22.6%)
	No	41 (77.4%)
Self-reported diagnosis		
	Major Depression Disorder	2 (3.8%)
	Generalized Anxiety Disorder	2 (3.8%)
	Obsessive-Compulsive Disorder	1 (1.9%)

Self-Report Instruments

In this study, self-report questionnaires and neuropsychological instruments were used. To see instruments specific details, see the previous section – *methodology* - of the

present doctoral proposal. Internal consistency and instruments scores are detailed in table 2.

Based on previous theorizations, several self-report questionnaires were used to assess *early disorder determinants*. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of Memphis, Pisa, Paris and San Diego-autoquestionnaire version (TEMPS-A, Akiskal et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et a., 2012) was used. Finally, to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess *maladaptive schematic functioning and states of mind.* To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Lehay Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020d) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

To assess *defensive maneuvers and critical consequences,* different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28

(DSQ, Saint-Martin, Valls, Rousseau, Callahan & Chabrol, 2013, revised Portuguese version by Martins, 2016) was used. To assess coping strategies the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth &Pokorny 1999, revised Portuguese version by Martins, 2016) was used. Finally, to assess emotional processing difficulties, the Emotional Processing Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, 2021) was used.

Mental skills and processes were assessed with different self-report measures. Metacognition was assessed with a combined score from the Metacognitive Self-Assessment Scale (MSAS, Pedone et al., 2017, Portuguese version by Faustino et al., 2019b). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório & Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009) was use.

Finally, to assess *adaptive self-states* the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino et al., 2021b) was used.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020, and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality was assured. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. A bonification was

given to each participant who completed the entire battery. The inclusion criteria were being over 18 and below 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder. This research was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

This present study has a cross-sectional/correlational and longitudinal design with a quantitative approach. Descriptive statistics were used for subsamples exploration. Brown (2006) skewness values should vary between -3 and $+3$ and kurtosis values between -10 to $+10$ to be adequate. Skewness and kurtosis were acceptable. Normal distribution was assumed (N >30), and a 95% confidence interval was assumed with a *p*-value of .05 (Pallant, 2007). To explore the association between constructs, Pearson correlations were used. To explore predictive values the hierarchical stepwise regression analysis were used. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

The following section details the statistical analyses that were performed to test study hypotheses and research aims. Descriptive statistics, such as internal consistency, means and standard deviations, are described in table 2 for moment one and in table 3 for moment two.

Table 2. Descriptive statistics of the psychological variables under study in moment one (N=53)

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Psychological Needs (NSRS-43)	.92	5.35	.88	.02	2.30	.56	-.30
Symptomatology (BSI-53)	.96	.86	.55	.70	7.02	-.68	.46
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.53	.67	1.06	4.09	.21	-.18

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Emotional Schemas (LSS-50)	.86	2.99	.52	2.02	4.29	.34	-.24
Interpersonal Schemas (IIP-32)	.86	1.42	.45	.56	2.41	.16	-.73
States of Mind (SMQ)	.93	2.69	.62	1.55	4.24	.12	-.68
Defenses and Critical Consequences							
Defensive Styes (DSQ-29)	.66	4.53	.71	2.68	5.96	-.05	-.14
Coping Strategies (Coping index of SMQ)	.87	3.12	.72	1.90	5.00	.17	-.52
Dysfunctional Interpersonal Cycles (IRPQ)	.81	2.83	.27	2.21	3.43	-.30	.01
Emotion Processing Difficulties (EPDS-R)	.94	2.59	.62	1.41	4.27	.14	0.02
Mental Skills and Processes							
Metacognition (MSAS)	.84	2.60	.93	1.00	4.75	-.02	-.75
Psychological inflexibility (CFQ)	.94	3.83	1.58	1.00	7.00	-.01	-.75
Cognitive Reappraisal (ERQ)	.73	4.46	1.25	1.33	7.00	-.41	-.18
Experiential Suppression (ERQ)	.65	2.83	.90	1.25	4.50	.06	-.96
Adaptative Self Domains							
Attachment/Belonging (SMQ)	.52	4.02	.63	3.00	5.50	.18	-.88
Self-Confidence/Coherence (SMQ)	.49	4.18	.68	3.00	5.50	-.06	-.88
Acceptance/Mindfulness (SMQ)	.26	3.22	.72	1.75	5.00	.31	-.13
Compassion/Emotional Fulfilment (SMQ)	.58	3.91	.96	2.00	5.75	-.07	-.69

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Differences in internal consistency, mean scores and standard deviations were found between moment one and moment two, which was expected, because despite being the same individuals, there is a 6-months interval between two moments. The overall internal consistency remains adequate, even though the composite subscale of acceptance/mindfulness of the States of Mind Questionnaire (Faustino et al., 2020) showed a lower consistency in both moments – see tables 2 and 3.

Table 3. Descriptive statistics of the psychological variables under study in moment two (N=53)

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Early Disorder Determinants							
Psychological Needs (NSRS-43)	.88	.62	.44	.02	1.74	.76	-.16

Symptomatology (BSI-53)	.95	5.49	.69	3.49	684	-.49	.35
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.37	.67	1.08	3.98	.34	-.38
Emotional Schemas (LSS-50)	.89	2.90	.56	1.92	4.61	.93	1.38
Interpersonal Schemas (IIP-32)	.85	1.92	.29	1.28	2.47	-.23	-.65
States of Mind (SMQ)	.94	2.41	.68	1.27	4.15	.32	-.51
Defenses and Critical Consequences							
Defensive Styes (DSQ-29)	.54	4.28	.58	3.00	5.36	-.25	-.67
Coping Strategies (Coping index of SMQ)	.92	2.78	.88	1.47	4.97	.37	-.68
Dysfunctional Interpersonal Cycles (IRPQ)	.88	2.83	.34	2.10	3.58	-.07	-.39
Emotion Processing Difficulties (EPDS-R)	.91	2.42	.61	1.32	3.82	.01	-.73
Mental Skills and Processes							
Metacognition (MSAS)	.81	3.96	.42	2.76	4.83	-.48	.51
Psychological inflexibility (CFQ)	.91	4.69	.92	2.50	6.83	-.08	-.06
Cognitive Reappraisal (ERQ)	.69	4.07	.18	2.00	6.75	.03	-.62
Experiential Suppression (ERQ)	.58	3.29	.41	1.00	6.29	.14	-.74
Adaptive Self Domains							
Attachment/Belonging (SMQ)	.59	4.32	.69	2.75	5.25	-.64	-.28
Self-Confidence/Coherence (SMQ)	.54	4.36	.66	3.00	5.75	.01	-.76
Acceptance/Mindfulness (SMQ)	.25	3.58	.74	2.00	5.25	.01	-.14
Compassion/Emotional Fulfilment (SMQ)	.54	4.42	.88	2.00	5.75	-.64	-.12

Note: CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

A *t*-test for independent samples was used to test hypotheses 1 to 5. Symptomatology, interpersonal schemas, states of mind, defensive styles, coping strategies, metacognition and mentalization, psychological inflexibility, experiential suppression, attachment/belonging, acceptance/mindfulness and compassion/emotional fulfilment were statistically different from moment one to moment two ($p <.01$). Overall, mean scores of maladaptive variables decreased, whereas scores of adaptive variables increased from moment one to moment two - see table 4

Table 4. T-test for independent samples for psychological variables under study (N=53).

	Moment One		Moment Two		t- Student		Sig Two Tailed
	Mean	(SD)	Mean	(SD)	t	df	p
Early Disorder Determinants							
Psychological Needs	5.35	.88	5.49	.69	-0.901	104	.37
Symptomatology	.86	.55	.62	.44	2.493	104	.01
Maladaptive Schemas and States							
Early Maladaptive Schemas	2.53	.67	2.37	.67	1.221	104	.22
Emotional Schemas	2.99	.52	2.90	.56	0.935	104	.35
Interpersonal Schemas	1.42	.45	1.92	.29	-6.815	104	.00
States of Mind	2.69	.62	2.41	.68	2.151	104	.03
Defenses and Critical Consequences							
Defensive Styes	4.53	.71	4.28	.58	1.921	104	.06
Coping Strategies	3.12	.72	2.78	.88	2.183	104	.03
Dysfunctional Interpersonal Cycles	2.83	.27	2.83	.34	0.006	104	.99
Emotion Processing Difficulties	2.59	.62	2.42	.61	1.446	104	.15
Mental Skills and Processes							
Metacognition and Mentalization	2.60	.93	3.96	.42	-9.643	104	.00
Psychological inflexibility	3.83	1.58	3.29	1.41	1.837	104	.06
Cognitive Reappraisal	4.46	1.25	4.69	.92	-1.084	104	.28
Experiential Suppression	2.83	.90	4.07	1.18	-6.074	104	.00
Adaptative Self Domains							
Attachment/Belonging	4.02	.63	4.32	.69	-2.308	104	.02
Self-Confidence/Coherence	4.18	.68	4.36	.66	-1.348	104	.18
Acceptance/Mindfulness	3.22	.72	3.58	.74	-2.572	104	.01
Compassion/Emotional Fulfilment	3.91	.96	4.42	.88	-2.822	104	.01

Note: **p<.05; *p<.01

Moment one and two were analysed separately to test hypotheses 6 to 9. Hierarchical regression analysis and Pearson correlations were used. Results are as follows.

Analysis of moment one

Table 5, describes a hierarchical stepwise regression analysis that explored relative weights of all variables under study in the explanation of the variance of

symptomatology. Early maladaptive schemas and emotional processing difficulties were the best predictors of symptomatology (R^2 = .68; b = -1.08, p <.01).

Table 5. Hierarquical stepwise regression analysis of variables under study with symptomatology as a dependent variable in moment one (N=53).

	B	Error	Beta	t	sig	Tolerance	VIF
Early Maladaptive Schemas	.35	.09	.43	3.55	.01	.42	2.34
Emotional Processing Difficulties	.40	.10	.45	3.76	.00	.42	2.34

Note: (R^2 = .68; b = -1.08, p <.01).

Correlations between symptomatology, psychological maladaptive schematic functioning and states of mind and defensive maneuvers were explored. Overall, identified correlations followed previous assumptions. Symptomatology was positively correlated with emotional processing difficulties (r = .78, p <.05), coping strategies (r = .72, p <.05) and defensive styles (r = .34, p <.01). Also, schemas and states followed the same patterns. As an example, early maladaptive schemas correlated positively with emotional processing difficulties (r = .75, p <.05), coping strategies (r = .82, p <.05) and defensive styles (r = .36, p <.01). However, interpersonal patterns and cycles did not correlate with any variable – see table 6.

Table 6. Pearson correlation of symptomatology, psychological needs, maladaptive schematic functioning, and states of mind with defensive maneuvers and critical consequences in moment one (N=53).

	Emotional Processing Difficulties	Coping Strategies	Dysfunctional Interpersonal Cycles	Defensive Styles
Symptomatology	.78**	.72**	.17	.34*
Psychological Needs	-.51**	-.56**	.18	-.02
Early Maladaptive Schemas	.75**	.82**	.05	.36**
Emotional Schemas	.58**	.51**	.14	.41*
Interpersonal Schemas	.62**	.71**	.17	.34*
States of Mind	.74**	.96**	.13	.30*

*Note: **p<.05; *p<.01*

Table 7 shows correlational analysis between symptomatology, psychological needs, maladaptive schematic functioning and states of mind and mental skills and processes in moment one. Overall, identified correlations followed previous assumptions. Psychological needs correlated negatively with psychological inflexibility ($r = -.52$, $p < .05$) and expressive suppression ($r = -.48$, $p < .05$), and positively with cognitive reappraisal ($r = .30$, $p < .05$) and with metacognition and mentalization ($r = .54$, $p < .05$). Early maladaptive schemas correlated positively with psychological inflexibility ($r = .71$, $p < .05$) and expressive suppression ($r = .63$, $p < .05$), and negatively with metacognition and mentalization ($r = -.76$, $p < .05$). States of mind followed the same pattern, with positive correlations with psychological inflexibility ($r = .69$, $p < .05$) and expressive suppression ($r = .69$, $p < .05$), and negative correlation with metacognition and mentalization ($r = -.77$, $p < .05$) – see table 7.

Table 7. Pearson correlations between symptomatology, psychological needs, maladaptive schematic functioning and states of mind, and mental skills and processes in moment one (N=53).

	Psychological Inflexibility	Cognitive Reappraisal	Expressive Supression	Metacognition and Mentalization
Symptomatology	.75**	-.01	.46**	-.58**
Psychological Needs	-.52**	.30*	-.48**	.54**
Early Maladaptive Schemas	.71**	-.03	.63**	-.76**
Emotional Schemas	.57**	.05	.31*	-.55**
Interpersonal Schemas	.52**	-.04	.55**	-.59**
States of Mind	.69**	.04	.69**	-.77**

Note: **p<.05; *p<.01

Finally, correlations between symptomatology, psychological needs, maladaptive schematic functioning and states of mind and adaptive self-domains in moment one were also explored. Overall, identified correlations followed previous assumptions. Symptomatology was negatively correlated with attachment /interpersonal safeness ($r = -.44$, $p < .05$), trust and integrity/assertiveness ($r = -.53$, $p < .05$) and compassion/emotional fulfillment ($r = -.68$, $p < .05$). Psychological needs revealed only a positive correlation with compassion/emotional fulfillment ($r = .66$, $p < .05$). Early maladaptive schemas

correlated negatively with attachment /interpersonal safeness ($r = -.55$, $p <.05$), trust and integrity/assertiveness ($r = -.68$, $p <.05$) and compassion/emotional fulfillment ($r = -.66$, $p <.05$) – see table 8.

Table 8. Pearson correlations between symptomatology, psychological needs, maladaptive schematic functioning and states of mind, and adaptive self-domains in moment one (N=53).

	Attachment /Interpersonal Safeness	Trust and Integrity/Assertiveness	Acceptance and Forgiveness/Mindfulness	Compassion/Emotional Fulfillment
Symptomatology	-.44**	-.55**	-.22	-.66**
Psychological Needs	.24	.19	.18	.66**
Early Maladaptive Schemas	-.55**	-.68**	-.25	-.66**
Emotional Schemas	-.30*	-.61**	-.08	-.43**
Interpersonal Schemas	-.57**	-.55**	-.22	-.58**
States of Mind	-.60**	-.63**	-.41**	-.84**

Note: **p<.05; *p<.01

Analysis of moment two

Table 9, describes a hierarchical stepwise regression analysis that explored relative weights of all variables under study in the explanation of the variance of symptomatology. Early maladaptive schemas, psychological needs and coping strategies were the best predictors of symptomatology ($R^2 = .73$, $b = 1.11$, $p <.01$).

Table 9. Hierarquical stepwise regression analysis of variables under study with symptomatology as a dependent variable in moment two (N=53).

	B	Error	Beta	t	sig	Tolerance	VIF
Early Maladaptive Schemas	.18	.10	.29	1.88	.06	.24	4.03
Psychological Needs	-.24	.06	-.39	-4.02	.00	.62	1.61
Coping Strategies	.15	.06	.30	2.23	.03	.31	3.14

Note: (R2 = .73, b = 1.11, p <.01).

Correlations between symptomatology, psychological maladaptive schematic functioning and states of mind and defensive maneuvers in moment two were explored. Overall, identified correlations followed previous assumptions. Symptomatology was positively correlated with emotional processing difficulties ($r = .65$, $p < .05$), coping strategies ($r = .71$, $p < .05$) and defensive styles ($r = .34$, $p < .01$). Also, schemas and states followed the same patterns. As an example, early maladaptive schemas correlated positively with emotional processing difficulties ($r = .74$, $p < .05$), coping strategies ($r = .82$, $p < .05$) and defensive styles ($r = .42$, $p < .01$). However, similarly to moment one, difunctional interpersonal cycles did not correlate with any variable – see table 10.

Table 10. Pearson correlation between symptomatology, psychological needs, maladaptive schematic functioning and states of mind, and defensive maneuvers and critical consequences in moment two (N=53).

	Emotional Processing Difficulties	Coping Mechanisms	Dysfunctional Interpersonal Cycles	Defensive Styles
Symptomatology	.65**	.71**	-.01	.34*
Psychological Needs	-.50**	-.43**	-.06	-.17
Early Maladaptive Schemas	.74**	.82**	.13	.42**
Emotional Schemas	.57**	.44**	.18	.39**
Interpersonal Schemas	.68**	.63**	.26	.46**
States of Mind	.74**	.96**	.11	.48**

Note: **p<.05; *p<.01

Table 11 shows analysis of correlations of symptomatology, psychological needs, maladaptive schematic functioning and states of mind with mental skills and processes in moment two. Overall, identified correlations followed previous assumptions. Psychological needs correlated negatively with psychological inflexibility ($r = -.57$, $p < .05$) and positively with metacognition and mentalization ($r = .53$, $p < .05$). Early maladaptive schemas correlated positively with psychological inflexibility ($r = .76$, $p < .05$) and expressive suppression ($r = .42$, $p < .05$), and negatively with metacognition and

mentalization ($r = -.33$, $p <.05$). Emotional schemas followed the same pattern, with positive correlations with psychological inflexibility ($r = .58$, $p <.05$) and expressive suppression ($r = .33$, $p <.05$), and negative correlation with metacognition and mentalization ($r = -.34$, $p <.05$). States of mind correlated positively with psychological inflexibility ($r = .71$, $p <.05$) and expressive suppression – see table 11.

Table 11. Pearson correlation of symptomatology, psychological needs, maladaptive schematic functioning and states of mind with mental skills and processes in moment two (N=53).

	Psychological Inflexibility	Cognitive Reappraisal	Expressive Supression	Metacognition and Mentalization
Symptomatology	.61**	-.02	.22	-.40**
Psychological Needs	-.57**	.21	-.16	.53**
Early Maladaptive Schemas	.76**	.03	.42**	-.33*
Emotional Schemas	.58**	.13	.33*	-.34*
Interpersonal Schemas	.64**	-.06	.41**	-.44**
States of Mind	.71**	-.03	.38**	-.23

Note: **p<.05; *p<.01

Finally, correlations between symptomatology, psychological needs, maladaptive schematic functioning and states of mind and adaptive self-domains in moment one were also explored. Overall, identified correlations followed previous assumptions. Symptomatology was negatively correlated with attachment /interpersonal safeness ($r = -.43$, $p <.05$), trust and integrity/assertiveness ($r = -.46$, $p <.05$) and compassion/emotional fulfillment ($r = -.61$, $p <.05$). Psychological needs only correlated positively with compassion/emotional fulfillment ($r = .48$, $p <.05$). Early maladaptive schemas correlated negatively with attachment /interpersonal safeness ($r = -.48$, $p <.05$), trust and integrity/assertiveness ($r = -.59$, $p <.05$), acceptance and forgiveness/mindfulness ($r = -.43$, $p <.05$) and compassion/emotional fulfillment ($r = -.77$, $p <.05$) – see table 12.

Table 12. Pearson correlation between symptomatology, psychological needs, maladaptive schematic functioning and states of mind, and adaptive self-domains in moment two (N=53).

	Attachment /Interpersonal Safeness	Trust and Integrity/Assertiveness	Acceptance and Forgiveness/Mindfulness	Compassion/Emotional Fulfillment
Symptomatology	-.43**	-.46**	-.26	-.61**
Psychological Needs	.13	.12	.08	.48**
Early Maladaptive Schemas	-.48**	-.59**	-.43**	-.77**
Emotional Schemas	-.27*	-.46**	-.21	-.44**
Interpersonal Schemas	-.30*	-.41**	-.31*	-.71**
States of Mind	-.61**	-.65**	-.55**	-.83**

Note: **p<.05; *p<.01

Discussion

The research aims of the second study were achieved. The exploration of the temporal stability of symptomatology and psychological needs associated with schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains was performed adequately. Also, the exploration of the relationships between these variables across different moments was achieved. Relevant considerations are described below.

Overall, there was a decreasing tendency from the first to second moment in the mean scores of the maladaptive variables (e.g., symptomology), and an increasing tendency in the mean scores of the adaptive variables (e.g., adaptive self-states). However, there were surprising patterns. The ***first hypothesis*** was refuted. Symptomatology did not reveal temporal stability, which is not compatible with previous assumptions (Fullana, et al., 2007; Hovenkamp-Hermelink et at., 2019; Rufer, Grothisen, Mab, Peter & Hand, 2005; Struijs et a., 2020). This result may have several interpretations based on the contextual specifications of the sample. This sample was composed by students of psychology. One likely explanation may be that most of the individuals in this subsample may be considered healthy individuals, because they are not in a psychotherapeutic process and they have mean scores in the BSI lower that <1.7, which

is the clinical criteria for Portugal (Canavarro, 1999). Thus, this is true for mean scores for both the first and second moment. Healthy individuals also experience symptomatology, however, due to psychological flexibility and adaptive healthy mental instances, they tend to recover rapidly to their emotional baseline (Faustino, 2020a; Faustino et al., 2020b). Another likely explanation may be related to the first moment and second moment of data acquisition. The first data acquisition process (first moment) was performed in the beginning of the academic year, which tends to be a stressful moment in the life of the students. The second data acquisition process (second moment) was performed six months after, in the beginning of the second semester, after the exam period. It makes sense that students are calmer and more relaxed after a stressful exam period, which would be captured by the BSI. Maybe this explains the decreasing effect in mean scores from the first to the second moment.

The *second hypothesis* was partially confirmed. The regulation of psychological needs, along with early maladaptive and emotional schemas, were stable over time, which is consistent with previous assumptions (Wang et al., 2010; Young et al., 2003). However, interpersonal schemas and states of mind were not, as both variables had higher mean scores in the second moment. It was expected that states of mind, which are volatile states regarding moment-to-moment activations of several clustered schemas, manifested differential mean scores across two different moments in time (Faustino et al., 2020b). Also, it was expected that all structural variables (e.g., psychological needs and schemas) had temporal stability because they tend to be regarded as psychological traits (Young et al., 2003). One explanation may be that interpersonal schemas have less stable structures than the other schemas, which makes them more vulnerable to interpersonal and contextual experiences, and therefore to restructuring. However, more research is required to explore this particularity. Another explanation may be that many of these

individuals are young adults which means that they are in a life stage that still gives too much importance to relationships due to interpersonal motivational systems in early adulthood (Liotti & Intreccialagli, 2003). This may have some impacts in their emotional life and in their professional/academic life. Thus, in the beginning of the second semester there are different work groups that are defined in each specific discipline, which may foster interpersonal problems regarding different work perspectives and methods.

The *third hypothesis* was partially confirmed, as only coping strategies was statistically different from the first to the second moment. There seems to be a decrease in the use of dysfunctional coping strategies overtime, which is compatible with the decrease in mean values in other variables. It is theoretically coherent that when individuals start to gradually change their unhealthy coping strategies to become more open to cope with challenging situations and emotional suffering, symptomatology decreases (Beck et al., 2004; Young et al., 2003). In the same manner it is expected that adaptive self domains also emerge, which is something that is observable in the mean scores and in the correlational analysis.

The *fourth hypothesis* was partially confirmed. Cognitive reappraisal revealed temporal stability, which is consistent with previous studies (Gross and John, 2003; Aldao et al., 2010). Psychological inflexibility also showed temporal stability, which is in line with previous studies (Gillanders et a., 2014). Metacognition and mentalization showed increased mean scores from the first to the second moment, which may reflect an increase in academically related self-reflectivity. Previous research shows that the number of years of schooling is associated with higher metacognitive abilities (Baker et al., 2020). In this sense, differences in mean scores may reflect an increase in metacognitive abilities related with the progression from the first moment (beginning of the first semester) to the second moment (beginning of the second semester). Moreover, the use of expressive suppression

seems to be higher at the second moment, which may also reflect differential use of this emotion regulation strategy within different contexts, and inconsistencies that are probably associated with other personality traits (Aldao et al., 2010; Faustino, 2020a, Faustino & Vasco, 2021; Haines et al., 2016; Webb et al., 2012).

The *fifth hypothesis* was partially confirmed. Three adaptive self-domains are not stable over time, because these self-domains were assessed with the States of Mind Questionnaire (Faustino et al., 2021b), which aims to assess volatile states. Therefore, as in the previous explanation, where volatile states manifested different mean scores at two different times in time, this was somewhat expected. Also, it is noteworthy that mean scores were higher at the second moment than at the first moment. Only self-confidence/coherence states were consistent over time, which may be attributed to healthy dispositional and structural features of individuals from a non-clinical sample.

The *sixth hypothesis* was confirmed, which confirms a tendency that has come to be identified in the literature. When symptomatology levels are lower, there are more variables that can explain symptomatology. This is especially relevant when non-clinical samples are compared with clinical samples (Almeida, 2016; Barreira, 2016; Faustino, 2020a, Faustino & Vasco, 2020a; Castelo-Branco, 2016; Martins, 2016). One likely explanation may be that the explanation of the variance of symptomatology is directly proportional to the severity/intensity of the dysfunctional variables. In other words, the more extreme the presence of dysfunctional variables (e.g., schemas, emotional difficulties), the less variables are required to the emergence of symptomatology. When the severity/intensity of those variables starts to decrease, other variables with lower intensity start to explain the manifested symptomatology.

Finally, *hypotheses seven* and *nine* received total empirical support, whereas *hypothesis eight* received partial support. The results regarding hypotheses seven and

nine demonstrate that the relationships between psychological needs, maladaptive schematic functioning and states of mind, defensive maneuvers and adaptive self-domains have temporal stability, even though they may be conceptualized as dispositional traits or contextual states. This evidence reinforces theoretical assumptions regarding the close relationships between the regulation of psychological needs, early maladaptive schemas, coping styles, emotional difficulties, defensive styles and symptomatology, as core variables in psychological functioning (Almeida, 2016; Barreira, 2016; Faustino, 2020a, Faustino & Vasco, 2020a,b,c Castelo-Branco, 2016; Martins, 2016; Sol & Vasco, 2017; Young et al., 2003). Moreover, hypothesis eight received partial confirmation because correlations of expressive suppression with symptomatology and psychological needs lost significance from the first to the second moment. As stated before, this may reflect sample features, contextual academic demands, situational application of expressive suppression and/or the softening of some variables which opens space for the emergence of the significance of other variables.

Overall, these results emphasize the importance of all those variables as differentiated for case conceptualization and clinical decision-making, due to: (1) discrepancies between symptomatology, maladaptive schemas, defensive maneuvers, mental abilities and self-states, (2) differentiation between dispositional traits and contextual states, (3) differentiation between generic coping styles and emotion coping, (4) critical variances in several constructs, (5) temporal stability of the relationship between maladaptive structures and coping variables; (6) temporal stability of the relationship between maladaptive variables and adaptive self-domains.

Limitations and Future Directions

Some limitations may be described. Data were acquired with self-reported instruments, which are limited to participants' self-awareness on the given constructs. This study was conducted on-line, without the presently supervision of the main researcher. The sample size ($N = 53$) is small, which limits generalizations and extrapolations of the results. The subsample had many more female responders than male responders, which may have introduced biased results. Finally, this study was conducted with university participants who configured a non-clinical sample.

Conclusions

The aims of the sixth study were achieved. The exploration of the temporal stability of symptomatology and psychological needs associated with schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains was performed adequately. Results suggests that these are core variables for the identification, explanation and description of dysfunctional personality patterns and symptomatology. Therefore, based on these preliminary results, this model adopts these core variables as foundational for psychological case conceptualization and clinical decision-making. However, more research is required to deepen and replicate these findings.

Study 7 - Associations of Core Dispositional Traits and Contextual States with

Clinical Decision-Making Variables

Associations of Core Dispositional Traits and Contextual States with Clinical Decision-Making Variables

Abstract

Understanding significant client variables is a core issue in clinical psychology and psychotherapy when it comes to tailoring the psychological intervention to specific individuals' features, styles of processing, and needs. Previous research documented that systematic treatment prescription based on patient psychological variables tends to increase the explained variance in psychotherapy outcome. However, the process of identification of these variables is still ongoing. This study has explored the associations of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and adaptive self-domains, with the Clinical Decision-Making Inventory. A sub-sample of 123 individuals (M=20.28, SD=5.80), who were engaged in a psychotherapy process, was assessed with several self-reported measures. Results showed significant negative correlations between maladaptive schematic functioning and stage process, motivational stage, therapeutic relationship, attachment style, reactance, and coping style. An inverse pattern was found regarding the adaptive variables. These results seem to support the notion that maladaptive schemas may be added to clinical decision-making profiles. Implications for the overall model are discussed.

Introduction

The quest for variables that increase the explained variance in psychotherapy outcomes is one of the focuses of the contemporary psychotherapy research process (Norcross & Wampold, 2019). As described in the previous section of the present doctoral thesis, research supports the claim that when clinical decision making is based on transdiagnostic patient variables, there is potentially an increase in the explained variance of the therapeutic outcome. Norcross and Wampold (2019) documented several meta-analyses based on patient variables/behaviors (what works in particular), where several elements of systematic treatment selection (Beutler, 2001) seem to gain prevalence. These studies were described in the previous section. The main findings emphasize the significance of several variables, such as levels of severity and complexity (Beutler et al., 2005), stages of motivational change (Krebs, et al., 2019), reactance level (Edwards et a., 2018), coping style (Beutler et al., 2018), attachment style (Levy et al., 2019) and working alliance (Flückiger et al., 2018) in the decision-making process. These variables may be found in the Clinical Decision-Making Inventory (Faustino & Vasco, in press). Based on Norcross and Wampold (2019) research, these variables seem to be highly significant in psychotherapy. Therefore, this study was based on the exploration of the association of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and adaptive self-domains with the variables of the Clinical Decision-Making Inventory (Faustino & Vasco, in press).

Clinical Decision-Making Profile to Enhance Responsiveness

Norcross and Wampold (2019) documented that the variance of psychotherapy outcome can be attributable to several therapeutic factors. Patient variables account for 30% of the variance and represent variables such as coping style, motivational stage and reactance level. The therapeutic relationship accounts for 15% of the variance, encompassing elements such as affective bond/attunement, tasks and goals. The treatment method accounts for 10%, and represents the application of specific techniques, such as Socratic dialog, exposure, or transference analysis. Other factors, such as therapeutic setting or distance from home account for 3% of the variance. Finally, the unexplained variance accounts for 35% of the therapeutic outcome.

Research is overwhelming when it comes to the significance of patient variables in psychotherapy outcome (Norcross & Wampold, 2019). Several studies supported previous assumptions that client behaviors are core aspects in psychotherapy because these specific variables tend to impact how individuals think, feel, and behave in and out of the sessions (Beutler et al., 2005, 2018; Flückiger et al., 2018; Edwards et a., 2018; Levy et al., 2019; Norcross & Wampold, 2019; Vasco et a., 2018). Different personality traits and states tend to require different postures and therapeutic tasks, which must be combined accordingly (Vasco et al., 2018). Based on this evidence, Faustino and Vasco (in press) developed the Clinical Decision-Making Inventory, to capture a clinical profile of the individuals which could potentially help therapists understand how they can make their decisions based on these variables.

The Clinical Decision-Making Inventory (Faustino & Vasco, in press) is a brief self-report inventory wherein individuals respond to several questions aiming to assess, from the client's perspective, the stage in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style, attachment style, and emotional stability.

This instrument has an empirical-based framework and assumes that if these variables are assessed early in psychotherapy, they may enhance the therapist's responsiveness in several stages of psychotherapy.

Stages in psychotherapy are described as the sequential temporal progressions that individuals go through in therapy. Vasco (2005) developed an integrative model based on a temporal sequencing of strategic principles (middle level of abstraction), which tends to favor patients' progress through the therapeutic process through the implementation of several therapeutic strategies: Trust, motivation, hope building and structuring (phase 1), Increasing awareness of self and experience (phase 2), Meaning-making regarding self and experience (phase 3), Regulation of responsibility (phase 4), Implementation of repairing actions (phase 5), Consolidation of change (phase 6) and Anticipation of the future and relapse prevention (phase 7). This process model has received empirical support, especially regarding the assimilation and accommodation of stage-dependent gains that were essential to different patients' abilities (Ferreira et al., 2017a,b). Also, Vaz (2018) found that changes from Phases 1-3 to Phases 4-7 were mediated by a decrease of unpleasant emotions.

The therapeutic relationship is defined as the quality and strength of the collaborative relationship (bond, goals, and tasks). As described previously, several meta-analytic studies support the importance of goal consensus and collaboration (Tyron et al., 2018) and the quality of the alliance in individual therapy (Flückiger, et al., 2019). Stages of Change (Prochaska and DiClemente, 1984), which are defined as the motivational stages of pre-contemplation, contemplation, preparation, action, and maintenance were found to be strongly correlated with psychotherapy outcome (Krebs et al., 2019).

Reactance level is defined as the tendency of the client to be easily provoked and respond oppositionally to therapist proposals. Beutler and colleagues (2005) stated that a

high reactance patient benefits more from self-control, minimal steering, and paradoxical interventions and low reactance clients benefit more from therapist directivity and explicit guidance. Edwards and colleagues (2018) found empirical support for the adaptation of the therapist's stance to the patient's reactance level. Coping style is defined as an enduring pattern of patients of dealing with stressful stimuli in an externalizing vs. internalizing manner. Beutler and colleagues (2018) state that interpersonal and insight-oriented psychotherapies are more effective among internalizing patients, whereas symptom-focused and skill-building psychotherapies are more effective among externalizing patients. The authors found empirical support for the adaptation of the therapist's stance to the patient's externalizing or internalizing coping style.

Attachment styles are defined as the structural affective bonds formed in childhood with the main caregivers which influence the relational patterns of adults in related relationships (Levy et al., 2019). Several studies explored relationships between maladaptive schemas and attachment styles. Platts and colleagues (2005) identified several maladaptive schemas in different attachment styles, in several samples. They found that individuals with the fearful attachment style possessed a greater severity of maladaptive schemas. Simard and colleagues (2011), through a 15-year longitudinal study, found that young adults who exhibited more signs of early maladaptive schemas (e.g., negative self-image, abandonment anxiety) were more likely to report insecure ambivalent child attachment, or an insecure preoccupied adult attachment style, compared to their secure peers. Roelofs and colleagues (2012) documented that the schema domain of disconnection/rejection was a significant mediator of the relationships between insecure attachment and peer problems and emotional problems. Finally, Hayden and colleagues (2019) found strong associations between interpersonal schemas where

friendly-submissive behavior was associated with attachment anxiety and hostile-dominant behavior with attachment avoidance.

Finally, the association of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and adaptive self-domains with coping strategies/styles and emotional stability were previously documented (Barreira, 2016; Castelo Branco, 2016; Faustino 2020a Faustino et al. 2020a,b; Faustino & Vasco a,b,c; Faustino et al., 2019a; Fonseca, 2012; Martins, 2016; Vasco et al., 2018). Despite the high relevance of these variables, research regarding the associations of stages in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style and attachment style with the variables under study (e.g., early maladaptive schemas, psychological needs, metacognition) in the present doctoral thesis is very sparce

Study hypotheses and research aims

As stated before, research regarding the relationships between dispositional traits (e.g., maladaptive schemas, defensive styles), contextual states (e.g., states of mind, emotional processing difficulties) and empirically-based clinically relevant variables (e.g., motivational states, reactance style) is sparce. In table 1, there is a brief conceptualization of the variables under study, such as early disorder determinants and maladaptive schemas. The clinically relevant variables are the stage in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style, attachment style and emotional stability. Therefore, this study has an exploratory framework, guided by several theoretically driven hypothesis:

H1: Early disorder determinants are associated with clinically relevant variables

H2: Maladaptive schematic functioning and states of mind are negatively associated with clinically relevant variables

H3: Defensive maneuvers and dysfunctional consequences are associated with clinically relevant variables

H4: Mental abilities and processes are associated with clinically relevant variables

H5: Adaptive self-domains are associated with clinically relevant variables

Table 1. Brief description of the personality core domains under study.

	Personality Core Determinants and Domains
Early Disorder Determinants *Early Complex Trauma* *Affective Temperament* *Parenting Styles* *Psychological Needs* *Symptomatology*	All significant variables or factors that have a major role in the development and/or maintenance of last-longing emotional suffering, cognitive-perceptual self-impairment, interpersonal behavior dysregulation, and systematic non-adaptation. These factors have pervasive impacts on schema formation and in the development of defensive maneuvers. These variables may also be described as antecedent factors.
Maladaptive Schemas and States of Mind *Early Maladaptive Schemas* *Emotional Schemas* *Interpersonal Schemas* *States of Mind*	Dysfunctional mental structures, with several mental elements (e.g., rigid beliefs and expectations, dysfunctional self-images, autobiographic memories, non-adaptive emotions), that encapsulate the pervasive meanings and learnings reflected on past dysfunctional experiences that are the foundational blocks of the vulnerable, weak, fragile or depleted self.
Defenses and Critical Consequences *Defensive Styles* *Coping Strategies* *Dysfunctional Interpersonal Cycles* *Emotion Processing Difficulties*	Maintenance implicit/automatic and/or explicit/deliberate processes and/or consequences that individuals engage to avoid, suppress, distort, or confront to deal with emotional suffering or stressful situations/contexts based on internal or external appraisals. These processes are responsible for schema maintenance.
Mental Skills and Processes *Metacognition and Mentalization* *Psychological inflexibility* *Cognitive Reappraisal* *Experiential Suppression*	Structural and functional low-level and higher-order mental processes that research showed to be highly significant to mental processing and affective regulation. These processes may be theoretically related to neurocognitive processes, such as executive functions, complex attention, autobiographical memory, and self-perception.
Adaptative Self Domains *Attachment/Belonging* *Self-Confidence/Coherence*	Healthy personality domains that are developed to counterbalance maladaptive schemas and/or traits. Encapsulates the adaptive schematic functioning that results from the adaptive

meaning-making that steamed from satisfactory early and later emotional and relational experiences.

Methods

Participants

The sample consisted of 123 participants, 15 males (12.2%) and 108 females (87.7%), with an age range between 18 and 57 years old (*M*=20.80, *SD*=5.28). Years of education frequencies were as follows: 111 (90.2%) with the 12th year, 7 (5.7%) with a bachelor's degree, and 5 (4.1%) with a master's degree. Almost all the sample was Portuguese 111 (90.2%). The frequencies and percentages distribution of the sample regarding the marital status is as follows: 119 (96.7%) were single, 1 (.8%) were married, 1 (.8%) were in nonmarital partnership and 2 (1.6%) were divorced. All participants were engaged in psychotherapy with several self-reported diagnoses, being generalized anxiety disorder (n=11, 2.2%), major depression (n=8, 1.6%), and depression and anxiety (n=7, 1.4%) the most prevalent – see table 2 for details.

Table 2. Descriptive statistics of the sample under study (N=123)

		Frequencies and Percentages
N		123 (100%)
Age		
	M	20.80
	SD	5.28
	Minimum	18
	Maximum	57
Gender		
	Male	15 (12.2%)
	Female	108 (87.8%)
Nationality		
	Portuguese	111 (90.2%)

	Brazilian	11 (9.0%)
	Moçambican	1 (.8%)
Scholarship		
	12th year	111 (90.2%)
	Bachelor's degree	7 (5.7%)
	Master's degree	5 (4.1%)
Marital Status		
	Single	119 (96.7%)
	Married	1 (.8%)
	Nonmarital partnership	1 (.8%)
	Divorced	2 (1.6%)
Psychotherapy		
	Yes	123 (100%)
	No	0 (0%)
Self-reported diagnosis		
	Generalized Anxiety Disorder	11 (2.2%)
	Major Depression	8 (1.6%)
	Depression and Anxiety	7 (1.4%)
	Panic Disorder	4 (.8%)
	Social Anxiety	1 (.2%)
	Anorexia Nervosa	3 (.6%)
	Co-morbid personality disorders	4 (.8%)
	Unspecified	8 (1.6%)

Self-Report Instruments

In this study, self-report questionnaires and neuropsychological instruments were used. To see instruments' specific details, see the previous section – *methodology* - of the present doctoral proposal. Internal consistency and instrument scores are detailed in table 3. Based on previous theorizations, several self-report questionnaires were used to assess *early disorder determinants*. To assess early complex trauma, the Childhood Trauma Questionnaire (CTQ, Bernstein, et al., 2003, Portuguese version by Dias et al., 2013) was used. To assess affective temperament, the Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-auto questionnaire version (TEMPS-A, Akiskal, et al., 2005, Portuguese version by Figueira et al., 2009) was used. To assess dysfunctional parenting

styles, the Young Parenting Styles (YPS, Young, 1994; Portuguese version by Salvador, Rijo & Pinto-Gouveia, 2003) was used. To assess the regulation of psychological needs, the Need Satisfaction Regulation Scale (NSRS-43, Vasco et a., 2012) was used. Finally, to assess psychopathological symptomatology, the Brief Symptoms Inventory-53 (BSI, Derogatis & Melisaratos, 1983, Portuguese version by Canavarro, 1999) was used.

Several self-report questionnaires were used to assess *maladaptive schematic functioning and states of mind.* To evaluate early maladaptive schemas, the Young Schema Questionnaire-S3 (YSQ-S3, Young, 2005, Portuguese version by Pinto-Gouveia, Rijo & Salvador, 2005) was used. To evaluate emotional schemas, the Leahy Schema Scale (LSS, Lehay, 2010, Portuguese version by Silva, Matos, Faustino & Neto, 2020) was used. To assess interpersonal schemas, the Interpersonal Problems Inventory-32 (IIP-32, Barkham, Hardy, & Startup, 1996, Portuguese version by Faustino & Vasco, 2020d) was used. Finally, to assess states of mind, the States of Mind Questionnaire (SMQ) was used. To assess *adaptive self-states*, the sub-scales of the adaptive self-factor from the States of Mind Questionnaire (SMQ, Faustino, et al., 2021b) was used. Also, to assess *adaptive self-states* it was used the sub-scales of the adaptive self-factor from the SQM.

To assess *defensive maneuvers and critical consequences,* different self-report measures were used. To evaluate defensive styles, the Defensive Styles Questionnaire-28 (DSQ, Saint-Martin, Valls, Rousseau, Callahan & Chabrol, 2013, revised Portuguese version by Martins, 2016) was used. To assess coping strategies, the factor domain of coping states of mind from the States of Mind Questionnaire (SMQ, Faustino, et al., 2021) was used. To assess relational cycles, the Interpersonal Relational Patterns Questionnaire (IRPQ, Kurth & Pokorny 1999, revised the Portuguese version by Martins, 2016) was used. Finally, to assess emotional processing difficulties, the Emotional Processing

Difficulties Scale-revised (EPDS-R, Faustino, Vasco, Silva & Barreira, in press) was used.

The **mental skills and processes** were assessed with different self-report measures. Metacognition was assessed with Metacognitive Self-Assessment Scale (MSAS, Pedone, et al., 2017, Portuguese version by Faustino et al., 2019a). To evaluate psychological inflexibility, the Cognitive Fusion Questionnaire (CFQ, Gillanders, et al., 2014, Portuguese version by Pinto-Gouveia, Dinis, Gregório & Pinto, 2013) was used. Finally, to assess emotion regulation strategies, the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003, Portuguese version by Vaz & Martins, 2009) was used.

Finally, to assess the **empirical-based clinical variables**, The Clinical Decision-Making Inventory (Faustino & Vasco, in prep) was used.

Procedures and Data Analysis

All participants were students at the Faculty of Psychology of the University of Lisbon, were recruited for three years, 2018/2019, 2019/2020, and 2020/2021, and were tested individually. Informed consent was obtained from all participants and confidentiality was assured. To have a valid participation, individuals had to complete a battery of self-report questionnaires in the online Qualtrics platform. A bonification was given to each participant who completed the entire battery. The inclusion criteria were being over 18 and below 65 years old, speaking Portuguese for more than 5 years, and not having a neurocognitive disorder. This research was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

This present study has a cross-sectional/correlational design with a quantitative approach. Descriptive statistics were used for sample exploration. Brown (2006) skewness values should vary between -3 and $+3$ and kurtosis values between -10 to $+10$

to be adequate. Skewness and kurtosis were acceptable. Normal distribution was assumed (N >30), and a 95% confidence interval was assumed with a *p*-value of .05 (Pallant, 2007). To explore the association between constructs, Pearson correlations were used. All statistical analyses were performed in IBM SPSS Statistics version 25.

Results

The following section details the statistical analysis that was performed to test the study hypothesis and research aims. Descriptive statistics, such as internal consistency, means and standard deviations are described in table 3.

Table 3. Descriptive statistics of the psychological variables under study.

	Cronbach Alpha	Mean	SD	Min	Max	Skewness	Kurtosis
Clinical decision-making variables							
Stage in Psychotherapy (CDMI)	.72	3.85	1.88	1	7	.05	-.98
Therapeutic Relationship (CDMI)	.72	4.41	.67	2	5	-.86	.30
Motivational Level (CDMI)	.72	4.15	.86	1	5	-1.06	1.48
Reactance Style (CDMI)	.72	4.09	.83	2	5	-.51	-.50
Coping Style (CDMI)	.72	3.14	1.36	1	5	-.11	-1.31
Attachment Style (CDMI)	.72	3.56	1.41	1	5	-.48	-1.16
Emotional Stability (CDMI)	.72	3.17	1.15	1	5	-.27	-1.05
Early Disorder Determinants							
Early Complex Trauma (CTQ)	.91	2.04	.66	1.36	3.36	.71	-1.09
Affective Temperament (TEMPS-A)	.80	1.42	.16	1.1	1.74	.06	-.99
Parenting Styles (YPI)	.93	2.47	.47	1.4	3.78	.32	-.29
Psychological Needs (NSRS-43)	.90	5.19	1.01	2.88	7.12	-.11	-.64
Symptomatology (BSI-53)	.96	1.39	.79	.11	3.28	.47	-.68
Maladaptive Schemas and States of Mind							
Early Maladaptive Schemas (YSQ-S3)	.96	2.77	.73	1.17	4.69	.09	-.50
Emotional Schemas (LSS-50)	.88	3.17	.53	2.08	4.57	.18	-.46
Interpersonal Schemas (IIP-32)	.87	1.58	.44	.56	2.5	-.06	-.73
States of Mind (SMQ)	.94	2.89	.75	1.24	4.63	.21	-.46
Defenses and Critical Consequences							
Defensive Styes (DSQ-29)	.65	4.39	.83	2.43	6.68	.10	-.32
Coping Strategies (Coping index of SMQ)	.90	3.32	.87	1.17	5.13	.01	-.58

Dysfunctional Interpersonal Cycles (IRPQ)	.83	2.87	.29	2.06	3.58	-.40	.33
Emotion Processing Difficulties (EPDS-R)	.90	2.79	.62	1.27	4.68	.24	.24
Mental Skills and Processes							
Metacognition (MSAS)	.72	4.12	.32	3.2	4.95	-.26	.23
Psychological inflexibility (CFQ)	.92	4.34	1.47	1.00	6.86	-.14	-.82
Cognitive Reappraisal (ERQ)	.78	4.28	1.27	1.33	7.00	-.13	-.67
Experiential Suppression (ERQ)	.75	3.94	1.17	1.00	6.51	-.16	-.63
Adaptative Self Domains							
Attachment/Belonging (SMQ)	.72	3.94	.70	2.25	5.25	-.15	-.52
Self-Confidence/Coherence (SMQ)	.69	3.85	.68	2.25	5.25	-.12	-.58
Acceptance/Mindfulness (SMQ)	.68	3.17	.70	1.75	5,00	.23	-.66
Compassion/Emotional Fulfilment (SMQ)	.69	3.22	.91	1.25	5.25	.21	-.52

Note: CDMI: Clinical Decision-Making Inventory; CTQ: Childhood Trauma Questionnaire; TEMPS-A: Temperament Evaluation of Memphis, Pisa, Paris, and San Diego-Questionnaire; YPI: Young Parenting Inventory; NSRS-43: Need Satisfaction Regulation Scale; BSI-53: Brief Symptoms Inventory; YSQ-S3: Young Schema Questionnaire; LSS-50: Lehay Schemas Scale; IIP-32: Inventory of Interpersonal Problems; SMQ: States of Mind Questionnaire; DSQ-29: Defensive Styles Questionnaire; IRPQ: Interpersonal relational Patterns Questionnaire; EPDS-R: Emotional Processing Difficulties Scale-Revisited; MSAS: Metacognitive Self-Assessment Scale; MS: Mentalization Scale; CFQ: Cognitive Fusion Questionnaire; ERQ: Emotion Regulation Questionnaire;

Differences in internal consistency, mean scores, and standard deviation were found between moment one and moment two, which was expected, because despite being the same individuals, there was a 6-months interval between the two moments. The overall internal consistency remains adequate.

Table 4 describes the analysis of correlations between early disorder determinants and the empirically-based clinical variables. Affective temperament was negatively correlated with motivational level ($r = -.21$, $p < .01$), reactance ($r = -.28$, $p < .01$), coping style ($r = -.28$, $p < .01$), attachment style ($r = -.41$, $p < .01$) and emotional stability ($r = -.20$, $p < .01$). Psychological needs correlated positively with stages of therapy ($r = .35$, $p < .01$), therapeutic relationship ($r = .26$, $p < .01$), motivational level ($r = .40$, $p < .01$), reactance ($r = .38$, $p < .01$), coping style ($r = .42$, $p < .01$), attachment style ($r = .59$, $p < .01$) and emotional stability ($r = .56$, $p < .01$).

Table 4. Person correlations between early disorders determinants and clinically relevant variables (N=123).

	Stage in Psychotherapy	Therapeutic Relationship	Motivational Level	Reactance	Coping Style	Attachment Style	Emotional Stability
Early Complex Trauma	.12	.10	.08	.08	.09	.08	.13
Affective Temperament	.01	-.11	-.21*	-.28**	-.28**	-.41**	-.20*
Parenting Styles	.13	.07	.09	-.01	.01	-.08	-.03
Symptomatology	-.18*	-.17*	-.24**	-.29**	-.30**	-.53**	-.49**
Psychological Needs	.35**	.26**	.40**	.38**	.42**	.59**	.56**

Note: *p<.01; ** p<.05;

Table 5 describes the analysis of correlations between maladaptive schemas and states of mind and the empirically-based clinical variables. All schemas and states correlated negatively with empirically-based clinical variables. As an example, early maladaptive schemas correlated negatively with stages of therapy ($r = -.19$, $p <.01$), therapeutic relationship ($r = -.28$, $p <.05$), motivational level ($r = -.44$, $p <.05$), reactance ($r = -.42$, $p <.05$), coping style ($r = -.50$, $p <.05$), attachment style ($r = -.58$, $p <.05$) and emotional stability ($r =- .46$, $p <.05$). States of mind correlated negatively with stages of therapy ($r = -.23$, $p <.01$), therapeutic relationship ($r = -.23$, $p <.05$), motivational level ($r = -.32$, $p <.05$), reactance ($r = -.34$, $p <.05$), coping style ($r = -.40$, $p <.05$), attachment style ($r = -.63$, $p <.05$) and emotional stability ($r =- .55$, $p <.05$).

Table 5. Person correlations between maladaptive schematic functioning and clinically relevant variables (N=123).

	Stage in Psychotherapy	Therapeutic Relationship	Motivational Level	Reactance	Coping Style	Attachment Style	Emotional Stability
Early Maladaptive Schemas	-.19*	-.28**	-.44**	-.42**	-.50**	-.58**	-.46**
Emotional Schemas	-.13	-.17	-.34**	-.40**	-.40**	-.42**	-.35**
Interpersonal Schemas	-.23**	-.29**	-.41**	-.32**	-.47**	-.52**	-.35**
States of Mind	-.23**	-.23*	-.32**	-.34**	-.40**	-.63**	-.55**

Note: *p<.01; ** p<.05;

Table 6 describes the analysis of correlations between defenses and critical consequences and the empirically-based clinical variables. Coping strategies correlated negatively with stages of therapy ($r = -.20$, $p <.05$), therapeutic relationship ($r = -.20$, $p <.05$), motivational level ($r = -.44$, $p <.01$), reactance ($r = -.31$, $p <.01$), coping style ($r =$

-.37, $p < .01$), attachment style ($r = -.56$, $p < .01$) and emotional stability ($r = -.51$, $p < .01$).

Emotional processing difficulties correlated negatively with motivational level ($r = -.30$, $p < .01$), reactance ($r = -.34$, $p < .01$), coping style ($r = -.36$, $p < .01$), attachment style ($r = -.51$, $p < .01$) and emotional stability ($r = -.49$, $p < .01$).

Table 6. Person correlations between defenses and critical consequences and clinically relevant variables (N=123).

	Stage in Psychotherapy	Therapeutic Relationship	Motivational Level	Reactance	Coping Style	Attachment Style	Emotional Stability
Defensive Styles	.13	-.01	-.01	-.04	-.10	-.13	-.03
Coping Mechanism	-.20*	-.20*	-.28**	-.31**	-.37**	-.56**	-.51**
Relational Cycles	.03	.07	.03	.06	-.05	-.01	-.04
Emotional Processing Difficulties	-.15	-.16	-.30**	-.34**	-.36**	-.51**	-.49**

Note: *p<.01; ** p<.05;

Table 7 describes the analysis of correlations between mental skills and process and the empirically-based clinical variables. Metacognition correlated positively with motivational level ($r = .29$, $p < .05$), reactance ($r = .33$, $p < .05$), coping style ($r = .31$, $p < .51$), and attachment style ($r = .21$, $p < .01$). Psychological inflexibility correlated negatively with stages of therapy ($r = -.26$, $p < .05$), motivational level ($r = -.23$, $p < .05$), reactance ($r = -.35$, $p < .05$), attachment style ($r = -.52$, $p < .05$) and emotional stability ($r = -.58$, $p < .05$). Cognitive reappraisal correlated positively with all variables. Finally, suppression correlated negatively with reactance ($r = -.20$, $p < .02$), coping style ($r = -.47$, $p < .05$) and attachment style ($r = -.24$, $p < .05$).

Table 7. Person correlations between mental skills and process and clinically relevant variables (N=123).

	Stage in Psychotherapy	Therapeutic Relationship	Motivational Level	Reactance	Coping Style	Attachment Style	Emotional Stability
Metacognition	.12	.16	.29**	.33**	.31**	.21*	.02
Psychological Inflexibility	-.26**	-.16	-.23**	-.35**	-.31**	-.52**	-.58**
Cognitive Reappraisal	.26**	.18*	.23**	.24**	.26**	.23**	.22*
Supression	-.04	-.08	-.11	-.20*	-.47**	-.24**	-.04

Note: *p<.01; ** p<.05;

Table 8 describes the analysis of correlations between adaptive self-domains and the empirical based clinical variables. Attachment/Belonging correlated positively with motivational level ($r = .26$, $p <.01$), reactance ($r = .25$, $p <.01$), coping style ($r = .35$, $p <.01$), attachment style ($r = .49$, $p <.01$) and emotional stability ($r = .38$, $p <.01$). Self-Confidence/Coherence correlated positively with motivational level ($r = .22$, $p <.01$), reactance ($r = .24$, $p <.01$), attachment style ($r = .34$, $p <.01$) and emotional stability ($r = .22$, $p <.01$). Finally, Compassion/Emotional Fulfilment correlated positively with stages of therapy ($r = .23$, $p <.05$), therapeutic relationship ($r = .18$, $p <.05$), motivational level ($r = .20$, $p <.01$), reactance ($r = .18$, $p <.01$), coping style ($r = .21$, $p <.01$), attachment style ($r = .38$, $p <.01$) and emotional stability ($r = .46$, $p <.01$).

Table 4. Person correlations between adaptive self-domains and clinically relevant variables (N=123).

	Stage in Psychotherapy	Therapeutic Relationship	Motivational Level	Reactance	Coping Style	Attachment Style	Emotional Stability
Attachment/Belonging	.07	.15	.26**	.25**	.35**	.49**	.38**
Self-Confidence/Coherence	.10	.17	.22*	.24**	.14	.34**	.22*
Acceptance/Mindfulness	-.11	-.08	-.10	-.13	-.03	.08	.05
Compassion/Emotional Fulfilment	.23**	.18*	.20*	.18*	.21*	.38**	.46**

Note: *p<.01; ** p<.05;

Discussion

The research aims of the second study were achieved. The exploration of relationships of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and adaptive self-domains with the clinically relevant variables was performed adequately. Relevant considerations are described below.

Regarding *hypothesis one*, several early disorder determinants were associated with clinically relevant variables, but not all were associated. Therefore, this hypothesis was partially confirmed. One major aspect that stems from the hypothesis is that early

complex trauma and parenting styles did not correlate with any variable of the Clinical Decision-Making Inventory. One likely explanation may be related to the degree to which these variables are represented in the client's mind and how they directly manifest in the psychotherapy process. As stated before, these two variables are major aspects that contribute to the development of early maladaptive schemas (Young et al., 2003), which means that early complex trauma and parenting styles manifest themselves in the maladaptive schematic functioning that individuals engage, which leads to difficulties in the regulation of psychological needs and symptomatology (Faustino & Vasco, 2020a,b,c; Faustino et a., 2020a). One could argue that early complex trauma and parenting styles may not interact directly with empirically-based clinical variables (e.g., stage of therapy and motivation), but interact indirectly through maladaptive schemas. Thus, the following hypothesis seems to support this assumption.

Another major issue regarding this hypothesis is concerned with the regulation of psychological needs. Individuals who are more able to regulate their psychological needs tend to be positioned in later stages of therapy and manifest adaptive levels of motivation, reactance, and satisfaction with the therapeutic relationships. Also, they manifest adaptive coping, attachment, and emotional stability. Accordingly, the regulation of psychological needs was previously associated with later stages in the psychotherapeutic process and adaptive emotional process (Conceição, 2010; Ferreira et al., 2015, 2016, Ferreira et al., 2015a,b; Vaz, 2018).

Maladaptive schematic functioning and states of mind were negatively associated with almost all clinically relevant variables. Only emotional schemas did not correlate significantly with stages of therapy and the therapeutic relationship. However, a tendency for significance was found. Therefore, based on this evidence, **hypothesis two** will be considered confirmed. The negative correlations between maladaptive schematic

functioning and states of mind and clinically relevant variables are supported by a wide range of theoretical and empirical findings that were described before (Faustino 2020a,b; Faustino et al. 2020a,b; Faustino & Vasco a,b,c; Faustino et al., 2019a; Fonseca, 2012; Martins, 2016; Vasco et al., 2018).

Maladaptive schemas are the dysfunctional mental structures that encompass previous maladaptive experience and learnings, which became embedded within the self and which guide future behavior. These structures are extremely rigid, broad, pervasive, and have an associated sense of pessimism. Therefore, individuals who have their thoughts, feelings, physical sensations, behaviors, and interpersonal reactions guided by these schemas manifest lower abilities to engage in a trustful therapeutic relationship, have lower levels of motivation and dysfunctional coping styles (Faustino et al., 2021) and are more likely to be afraid or have anxiety attachment styles (Simard et al., 2011).

It is noteworthy that states of mind followed the same pattern. One likely explanation may be that, when it comes to these dysfunctional variables (e.g., schemas and states), the notion of a differentiation between dispositional traits and contextual states may not have statistical utility, because both constructs manifested the same correlational pattern with the clinically relevant variables. One could argue that despite their recurring nature (e.g., traits of states), they both are negatively associated with stages of therapy, motivation, reactance, enchantment styles, and emotional stability and they both should be addressed in psychotherapy based on the degree of severity. Moreover, these results emphasize the importance of the assessment of these clinically relevant variables along with the assessment of maladaptive schemas and states of mind.

Hypothesis three received partial confirmation. Only coping strategies was negatively correlated with all clinically relevant variables. This may imply that individuals who rely on dysfunctional coping strategies to deal with the stress of thoughts,

emotions, behaviors, and interpersonal reactions may have more difficulty to progress in the psychotherapy process, develop a healthy working alliance, and manifest adaptive levels of motivation. Also, these individuals seem to manifest more internalizing coping styles, lower levels of reactance, attachment abilities, and emotional stability. As stated before, coping strategies are key maintenance factors of maladaptive schemas and long-standing psychological problems (Beck et al., 2004; Dimaggio et al., 2015; Young et al., 2003). In this sense, these results imply that the clinical decision-making process should take dysfunctional coping strategies into account. Emotional processing difficulties followed a similar correlational pattern, which means that emotional difficulties may also be considered when it comes to exploring the different dysfunctional consequences of maladaptive psychological variables.

Regarding *hypothesis four*, metacognition and suppression did not correlate with stages of therapy and therapeutic relationships, which means that this hypothesis only received partial support. Overall, metacognition and cognitive reappraisal correlated positively with reactance, coping style, and attachment style, which means that these adaptive mental skills and processes may be relevant regarding the clinical decision-making process. Thus, metacognitive skills may lie at the core of the decentering/distancing, which may be viewed as a necessary mental ability to soothe internal criticism and emotional suffering (Faustino et al., 2019a). It is the ability to distance from the experiential self, and into the reflective self, which allows individuals to soothe emotional pain, take different perspectives and reflect on past experiences (Faustino et al., 2019a; Faustino, 2020, 2021). Thus, cognitive reappraisal may also be viewed as a process that results from this swinging back and forth from the experiential self to the reflexive self, allowing more adaptive appraisals regarding triggering events. This process may have some overlapping with cognitive defusion (Hayes et al., 2013).

By being negatively correlated with clinically relevant variables, psychological inflexibility emerged as a core variable in the decision-making process, which is in line with previous assumptions (Faustino et al., 2019; Faustino, 2020; Faustino & Vasco, 2020a; Hayes, 2013; Martins, 2016).

Finally, *hypothesis five* received partial confirmation. Attachment/Belonging, self-confidence/coherence and compassion/emotional fulfillment were positively correlated with clinically relevant variables, which was theoretically expected. Only acceptance and mindfulness adaptive self-domain did not correlate with any clinically relevant variables. As described previously this may be a consequence of poor internal consistency of the subscale of the SMQ. In this sense, it is safe to assume that more research is required to explore how acceptance and mindfulness adaptive self-domain relates to stages in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style, attachment style, and emotional stability of the Clinical Decision-Making Inventory.

Limitations and Future Directions

Some limitations may be described. Data was acquired with self-reported instruments, which are limited to participants' self-awareness of the given constructs. This study was conducted on-line, without the presential supervision of the main researcher. The sample size ($N = 134$) was small, which limits generalizations and extrapolations of the results. The subsample had many more female responders than male responders, which could have introduced biases in the results. Finally, this study was conducted with university participants.

Conclusions

The aims of the seventh study were achieved. The exploration of the association of maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and adaptive self-domains with the stage in psychotherapy, therapeutic relationship, motivational level, reactance style, coping style, attachment style, and emotional stability was performed adequately. Results suggest that these may be core variables for psychological case conceptualization and clinical decision-making. However, more research is required to deepen and replicate these findings.

PART FOUR: INTEGRATIVE DISCUSSIONS AND FINAL THOUGHTS

The main goal of the present doctoral thesis was achieved. Based on previous theoretical and research findings regarding the integration of psychology and neurosciences, it was possible to elaborate and conduct several empirical studies. The need for a clear rationale and conceptual framework is a long-standing issue in psychotherapy, especially when it comes to understanding how neurocognitive or neurobiological findings can be articulated with psychology (Cozolino, 2017; Grawe, 2004; Siegel, 2012; Tyron, 2004). It was also possible to explore relationships between different psychological variables that were not previously tested (e.g., schemas and states of mind). Aligned with this aim, it was possible to explore and differentiate several relationships between different psychological and neurocognitive constructs that were not explored before, with different methodologies, such as self-report questionnaires and performance-based neuropsychological tasks. It was also possible to explore how these variables were associated with psychophysiological variables. Finally, it was possible to explore the stability of these variables across two different moments in time.

The main literature review of the present work was performed in a way that allows the development of an overall perspective focused on the assimilation and accommodation of different psychological and neuropsychological constructs in a coherent and comprehensive rationale. The main literature review was extremely important to establish several foundational theoretical aspects: (1) multidimensional human complexity, (2) core relationships between mind, brain processes, and behavior, and (3) the need for integrative models between psychology and neurosciences. Based on this perspective, it was possible to develop several empirical studies, which allowed the exploration of specific research questions based on specific research problems or gaps in the literature. Seven studies were then detailed with results presented independently in the previous section.

This third and final section of the present doctoral thesis is focused on the presentation of the main results in an integrated manner to help consolidate previous theorizations. In this sense, the main results will be described and integrated coherently. Also, the main limitations will be discussed. Finally, clinical implications and future directions will be discussed.

1. Integrative Psychological and Neurobiological Transtheoretical Metamodel

The present doctoral thesis had a purely translational, transtheoretical and integrative foundation due to the expansion of the matrix of the fundamental axiom for the interpretation of human and clinical phenomena. In order to look at the phenomena to investigate and produce empirical sense, it was necessary to study and integrate theories and methods of psychology and neuroscience. In fact, the results were largely satisfactory, with regard to the development of this research: (1) develop and adapt of psychological assessment measures; (2) to identify relationships between fundamentally dysfunctional transtheoretical variables; (3) explore the associations between psychological and neurocognitive variations; (4) explore the relationships between psychological variables and psychophysiological variables; (5) contrast two subsamples (non-clinical vs. clinical); (6) test temporal variations between traits and state variables; and (7) explore associations between traits and states and a clinical profile.

This work shows the suitability of the use of higher-order integrative, transtheoretical, translational and/or metaparadigms to identity, describe, explore and postulate interventions empirically based. As stated before, the complexity of human existence and behavior transcends the ordinary and are multidimensional, being considered one of the most challenging phenomena to be understood (Kuhn, 1996; Cacioppo et al., 2010) and paradigms unfold as foundational frameworks for consistency and coherence through

different research-informed fields (Norcross & Goldfried, 2019; Tyron, 2014). Thus, it is the systematic combination and/or articulation of new/old methods that boosts empirical and conceptual accumulations from different scientific fields that elicits the development of that new perspectives, approaches, taxonomies, and/or methodologies for more adjusted worldviews. Barlow (2014) described that to satisfy the demand for new methods and models for observing/explaining phenomena it is necessary to adopt a translational and integrative science, by combined different methods (e.g., psychological and neuroscience) which may set new perspectives on the understanding and relieving mental disorders. In this sense, the *Integrative Psychological and Neurobiological Transtheoretical Metamodel*", maybe be regarded as a new attempt to accomplish that goal.

Further, the present work was based in several main elements that were combined to solidify the study rationale. First, it was adopted an *metatheoretical and multidimensional approach to human complexity,* by combining the suggestions of Cacioppo and Berntson (1992) where an multilevel integrative analysis should be given at a microscopic level (neurosciences) and macroscopic level (social complex behavior). The three principles (multiple determinism, nonadditive determinism and reciprocal determinism), were used to understand how low-level biological variables (e.g., regions of neuronal networks and EEG waveforms) and higher-level psychological variables (e.g., needs, schemas, states of mind) interact and influence each other to produce human experience and behavior.

Second, a mult*ilevel complexity-based dialectical constructivism* ontological perspective was postulated in order to understand that in a given context, humans change their behavior and adapt to new social contexts and environments and that their actions shaped and reshaped their neurobiology (reciprocal dyadic between brain-behavior). In this sense, clinical phenomena results from the interplay between crystallized cognitive-

affective structures and moment-by-moment experience through a dialectical relationship between sensory/perceptual and symbolic/logical information.

Third, by adopting a conceptual and empirical approach with a neuroscience-based methodology to explore psychological processes, this research took the lead to establish a psychotherapy neurobiologically-informed. The exploration of the relationships between self-report instruments, neurocognitive assessment performance and an experimental EEG tasks showed the associations between dispositional traits (e.g., early maladaptive schemas) and neurocognitive domains (eg., cognitive flexibility and inhibition). It showed also the associations between automatic behavioral tendencies and bottom-up emotional processing with dispositional traits (e.g., early maladaptive schemas, emotional schemas). Also, the integration of the neural network perspective (Faustino, 2021), solidifies the rationale of the present study by bringing brain-based models to psychotherapy. These results supports the previous assumption of *a call for a neurobiological perspective on psychotherapy.*

Fourth, by using a *transtheoretical, diagnostic and transdiagnostic perspectives* to understand and explore the relationships between clinical phenomena, this research showed to be rooted in recent empirical findings (Faustino & Vasco, 2020a,b,c,d, 2021; Lambert & Barley; 2002; Goldfried, 2019; Newby, et al., 2015; Norcross & Goldfried, 2019; Norcross & Wampold, 2019). As stated previously, empirical data supports a transtheoretical approach with both diagnostic and transdiagnostic perspectives. Both have valences that can be used to customize and adapt the case conceptualization and psychological treatment (or responsiveness) to client features, styles of communication, stage motivations, schemas and emotional needs (Faustino & Vasco,2020a,b,c; Norcross & Wampold, 2019).

Five, the path *towards an integrative disorder theory* showed the complexity of the human developmental trajectories and the multiplicity of factors that work in a reciprocal manner to shape human behavior (adaptive or maladaptive). Through sequential mediations was possible to document the several paths that can be traced from toxic early experiences to the development of maladaptive schematic functioning and states of mind, which in turn, disrupts the regulation of psychological needs which facilitates psychopathological symptomatology. Thus, core emotional needs are regarded as one of the cornerstones of mental health and well-being (Faustino & Vasco,2020a,b,c; Vasco et al., 2018).

Six, *beyond a single theoretical approach case conceptualization* allowed the development of higher order categories allowed the assimilation and accommodation of several constructs from diverse theoretical orientations (e.g., early disorder determinants, defensive maneuvers and dysfunctional consequences), into a coherent rationale that may be an asset to case conceptualization. As suggested, the notions of *dispositional traits* (e.g., temperament, early maladaptive schemas, and coping mechanisms) and *contextual states* (e.g., states of mind, emotional difficulties) can be used as key concepts to organize clinical thinking.

Seven, by adopting *a science-based approach to the process of change* which allowed the exploration of a time dimension/progression of the relationships between the psychological constructs understudy (e.g., psychological needs, maladaptive schemas and states of mind), supports an reality-based perspective of the everyday human functioning which is a core issue to be taken into account in the *clinical decision making* process. Finally, it is the combination of all these domains that supports the translational science and integrative perspective of the *Integrative Psychological and Neurobiological Transtheoretical Metamodel.*

2. Need for Validated Instruments

The first study documents the development and validation of several assessment measures, which were essential for the empirical exploration of the previous hypotheses. Despite recent studies and attempts to conduct several validations of assessment methods, there is still a long-standing issue regarding the validation of psychological instruments for European Portuguese (Almeida, 2018; Faustino et al., 2019a, 2020c). This applies not only to self-report instruments but also to performance-based tasks (Almeida, 2018; Faustino, Oliveira & Lopes, 2020). The lack of adapted and psychometrically validated measures to performe psychological and/or neuropsychological assessments may have several implications. The concept of measuring a neurocognitive or psychological variable presupposes a delimitation of the construct, framed in the breadth of the dimensions operationalized in the self-report instrument or neuropsychological test (Anastasi & Urbina, 1997; Lezak, et al., 2014; Urbina, 2007). To make a comparison between the levels of functionality, an intra-individual comparison must be made, that is, the subject is compared with himself, and an inter-individual comparison must also be made, where the subject is compared with a normative group (Lezak, et al., 2014; Kessles & Hendriks, 2016). Usually, the cultural factor is one of the determining variables in the performance of specifics, namely at the cognitive level, so each test must have specific rules for the culture where it will be used (Anastasi & Urbina, 1997; Shan et al., 2008).

Normally, a subject's performance on a neuropsychological test or in a self-report measure is expressed in a quantitative result called a gross result. However, in terms of clinical decision-making, gross results are irrelevant without a way of comparing the subject's performance and/or self-appraisal with his reference group (Lezak, et al., 2014; Kessles & Hendriks, 2016). Thus, to assess an individual's cognitive ability in a given neuropsychological test or in a self-report instrument, it is necessary to perform a

statistical comparison between his performance on the test and his reference group, that is, the normative group (Lezak et al., 2014; Kessles & Hendriks, 2016; Zilmer et al., 2008). Moreover, without an adapted instrument, this is not possible, which may limit the clinical accuracy of case conceptualization and decision making. Therefore, to tailor the psychological and neuropsychological assessment to individual characteristics it is extremely important to have psychometrically validated instruments.

3. Complex relationships between personality domains and mental processes

Clinical psychologists and psychotherapists deal with human suffering and complexity every day. Human beings are capable of extraordinary adaptations in the face of danger, loss, trauma, and death. However, these dysfunctional experiences tend to have several implications for psychological flexibility, growth, well-being, and life-satisfaction (Vasco et al., 2018; Young et al., 2003). This study provided some results that support these assumptions. Several complex models revealed some complex associations between early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains.

Coherent with several theoretical orientations and previous research findings, early complex trauma showed several associations with maladaptive schemas, affective temperament, and states of mind (Dimmaggio et al., 2015; Young et al., 2003). These results help to consolidate previous theoretical assumptions that early complex trauma may be one of the most important variables in explaining the emergence of long-lasting symptomatology, psychological vulnerabilities, and personality disorders (Dalsklev, et al., 2019; Humphreys et al., 2020; Sudbrack et al., 2015; Zatti et al., 2017). Early complex trauma may be viewed as involving extremely toxic experiences, such as emotional and

physical abuse, neglect and bullying, which contribute to the frustration of core emotional needs (Humphreys et al., 2020; Young, et al., 2003). These frustrations interact with other variables, fostering the development of core mental structures which encapsulate emotional pain and dysfunctional beliefs about the self and others (Young et al., 2003). This describes the development of an early maladaptive schema which tends to be described as a core variable in chronic symptomatology and psychological disorders (Young et al., 2003). In this sense, results seem to support this assumption.

Another major aspect was the lack of association between early complex trauma and emotional and interpersonal schemas. This raises some theoretical considerations for overall schema theories regarding schema formation. Early determinants such as early complex trauma, temperamental traits, and parenting styles may interact in a way that enhances maladaptive schema formation. Then, based on child psychological and neurobiological developmental stages, schemas start to develop and differentiate through other mental domains and areas. Due to developmental issues, children need to develop new schemas to interpret and make sense of the world (Piaget 1923). Individuals based on previous schemata may start to develop new maladaptive schemas when they need to make sense of their emotional experience and their relationships with significant others. Therefore, based on previous schemas and new experiences, individuals may form maladaptive emotional and interpersonal schemas that are not directly based on previous early complex trauma. This explains the lack of correlations between early complex trauma and emotional and interpersonal schemas and supports the notion of temporal schema formation and differentiation based on different developmental stages and challenges.

Moreover, several relationships between maladaptive schematic functioning and the regulation of psychological needs were described, consistently with previous findings

(Almeida, 2016; Faustino & Vasco, 2020a,b,c; Faustino et al., 2020a; Fonseca, 2012; Martins, 2016). This result consolidates previous assumptions regarding schema formation and the regulation of psychological needs. According to Vasco and colleagues (2018), the cornerstone of mental health is the regulation of psychological needs. It is the ability to swing back and forth between a continuum on fourteen dialectical needs that allows humans to adapt to external and internal demands. In this sense, maladaptive schemas may be viewed as obstacles regarding these processes because of the structural inflexibility that is embedded in these maladaptive structures. From another perspective, schemas may also be regarded as maladaptive learnings regarding the toxic frustration of core emotional needs in infancy (Young et al., 2003), which means that individuals are functioning based on maladaptive learning which lead them to chronic life dissatisfaction, and psychological distress (Sol & Vasco, 2017; Vasco et al., 2018).

Results suggest that states of mind may also have an extremely important role in emotional suffering and psychological distress, which is aligned with previous theorizations (Horowitz, 1989, Dimaggio et al., 2007; 2015; Siegel, 2012). Research on states of mind is sparse due to the lack of construct delimitation and validated measures. The States of Mind Questionnaire (SMQ, Faustino, et al., 2021b) was recently developed to try to capture the volatile nature of these recurring states. Despite the novelty of this instrument, there is still space for psychometric improvement. Nevertheless, through the SMQ, it was possible to understand the close relationships between states of mind and other psychological constructs, such as early complex trauma, emotional schemas, defensive styles and metacognition. Thus, states of mind represent the activation at the same moment of seven psychological elements articulated thematically, which tend to be maladaptive and facilitate symptomatology (Faustino et al., 2020b). The results described previously largely support this definition.

Moreover, despite the lack of research on states of mind, the schema mode concept has been continuously investigated and received a substantial amount of empirical support, especially regarding paranoid, dependent, and obsessive-compulsive personality disorders (Arntz et al, 2005; Bamelis et al., 2011; Lobbestael et al., 2008, 2010). As stated before, states of mind and schema modes are two similar definitions developed from different traditions that share similarities and differences. At a theoretical level, maybe schema modes are more associated with external behavior and states of mind with internal experience. If so, clinical tasks may be elaborated further on these specifications, such as chair work for mode dialogues and insight, decentering, or reflective dialogue for states of mind. However, this claim remains speculative, and more research is required to explore this issue.

This research showed that maladaptive schematic functioning is strongly associated with symptomatology and individuals need to cope unconsciously and consciously with the dysfunctional emotionality that is embedded in these schemas and states. And that research also showed that the need for psychological defenses does not depend only on a type of maladaptive schema, but also on the other types of schemas (emotional and interpersonal). Individuals with severe maladaptive schematic functioning need to defend themselves from the pain of any type of maladaptive schemas, and this was evident in the present research. To deal with emotional suffering, painful autobiographic memories, fragmented self-image, stressful situations, and/or unwanted thoughts, individuals use implicit/automatic and explicit/deliberate ways to avoid, suppress, overcompensate, or transform these dysfunctional mental contents. Thus, these processes may be divided through criteria (e.g., intentional vs unintentional, conscious vs unconscious) which may inform different therapeutic tasks and the pervasiveness of those psychological defenses (Cramer, 1998; Vaillant, 2020). Moreover, when individuals

avoid, suppress, overcompensate, or transform the dysfunctional affective pain embedded in maladaptive schemas, they are preventing it from reaching the consciousness level that allows cognitive and affective restructuring associated with schema healing (Young et al., 2003). Moreover, by using these automatic and deliberate processes, individuals are blocking cognitive, emotional, behavioral, and relational corrective experiences which maintain the associations between several dysfunctional mental contents (Dimaggio et a., 2015; Faustino & Vasco, 2020a,b,c; Faustino et al., 2020a; Young et al., 2003). Finally, it is important to emphasise the study of Ferreira (2020), who documented a relationship between cognitive distortions and mentalization. The author describes negative correlations between mentalization abilities and several cognitive distortions (e.g., selective abstraction). Cognitive distortions may also be regarded as defensive manoeuvres because they prevent individuals from processing information which disconfirms schema beliefs. This process impairs schema restructuring, acting as a maintenance factor. In the future, the relationships between defensive styles, coping mechanisms and cognitive distortions will be explored, as they encompass the core elements of the construct of defensive manoeuvres.

The articulation between early maladaptive schemas and emotional processing difficulties had already been established before (Faustino et al., 2019; Faustino & Vasco, 2020c), but the present study took these relationships one step further. By describing several mediational roles of emotional processing difficulties in the relationships between maladaptive schematic functioning, psychological needs, and symptomatology, this study validated previous theorizations wherein emotional processing difficulties are associated with different cognitive, emotional, and interpersonal schemas. Therefore, individuals who have thoughts such as *I am unworthy, because of the bullying that I suffered* (defectiveness schema), *I can´t stand what I feel, and this makes me a weak person*

*(*emotion schema), or "*They are always rejecting me"* (interpersonal schema), may experience, to some degree, any form of emotional processing difficulties. Moreover, these results support the use of emotional markers and emotional tasks (Ellitot et al., 2004; Greenberg & Goldman, 2017) to work on emotional processing difficulties along with other schema restructuring tasks.

Similar to the relationship between maladaptive schemas and emotional processing difficulties and psychological needs, interpersonal dysfunctional cycles are associated with these two constructs. Thus, these relationships were also established before (Almeida, 2016; Faustino & Vasco, 2020a, Martins, 2016), but these results emphasize another perspective, especially regarding the mediational role of the intersubjective relational process in the relationship between maladaptive schemas and psychological needs. Individuals who have their interpersonal behavior driven mainly by maladaptive schemas tend to engage in interpersonal dysfunctional cycles, which in turn contributes to difficulties in the regulation of psychological needs, which in turn may prompt symptomatology. Thus, these four variables may be regarded as maintenance factors of psychological disorders, because they all prevent individuals from engaging in corrective experiences.

Close relationships between maladaptive schematic functioning and metacognition, psychological inflexibility and emotion regulation were described, and matched theoretical predictions (Dimaggio et al., 2015; Faustino et al., 2019; Faustino, 2020, 2021; Faustino & Vasco, 2020a). These variables were closely associated with schemas, psychological needs, and symptomatology, which suggests that these variables may have several contributions to mental health. These results suggest that individuals with difficulties in identifying, describing, and differentiating perceptions, needs, and beliefs from self and others may have a sense of a fragmented, vague, or conflicted self,

with prevents them from shifting from the experiential self to the reflexive self (Faustino et al., 2019), imposing several barriers to psychological adjustment (Pedone et a., 2017; Semerari, et al., 2003).

These results may also reflect, to some degree, the level of psychological inflexibility that can be associated with difficulties in shifting from the experiential self to the observer self. Psychological flexibility may be seen as a wide feature of the human mind, being present in all mental structures, contents, products, and neurocognitive variables, which is why psychological flexibility is described as one fundamental aspect of mental health (Hayes et al., 2013; Kashdan, 2010; Kashdan & Rottenberg, 2010). Individuals who are psychologically flexible can identify, describe, and differentiate mental elements from self and others and distance themselves from their perspectives in order to solve problems. Also, they have, to some extent, several degrees of psychological flexibility to adapt to changing internal and environmental demands, even in emotionally laden situations (Faustino, 2020). Thus, research supports the reverse, where psychological inflexibility tends to be associated with psychological distress (Bardeen and Fergus, 2016; Krafft et al., 2019), symptomatology (Gillanders et al., 2014), impairment of emotional differentiation (Plonsker et al., 2017), early maladaptive schemas (Faustino & Vasco, 2020b) and emotion regulation difficulties (Castelo Branco, 2016; Faustino, 2020).

Emotion regulation is one of the most important abilities for psychological wellbeing (Greenberg, & Goldman, 2017; Gross & John, 2003). Results in the present work are aligned with this perspective. The flexibility in applying different emotion regulation strategies seems to be a core aspect in the adaption to environmental demands, but it seems that cognitive reappraisal may be viewed as an adaptive strategy whereas expressive suppression may be viewed as a maladaptive strategy. This notion has received

extensive empirical support (Aldao et al., 2010; Webb et al., 2012). However, several authors emphasize the notion that individual differences in the application of different coping responses may be a core factor for adaptability.

Morris and Mansell (2018) stated that it is the rigid use of expressive suppression, regardless of context-specific demands that facilitates symptomatology. Webb and colleagues (2012) emphasized that different strategies in emotion regulation may lead to several levels of effectiveness (e.g., reappraising the emotional response was less effective than reappraising the emotional stimulus), which may also be dependent on different stages of emotion generation (Gross and John, 2003). Further, emotion regulation difficulties and inflexibility were previously associated with maladaptive schematic functioning (Cisler et al, 2010; D'Avanzato, et al., 2013; Edwards, & Wupperman, 2019; Krause et al., 2003; Faustino, 2020; Webb, et al, 2012). Therefore, cognitive reappraisal and expressive suppression may be differentiated targets for psychological intervention.

Finally, the notion that adaptive self-domains are core aspects of emotional well-being, psychological health, and life-satisfaction, was one of the driving forces in the present research. As expected, adaptive states of mindfulness and acceptance, confidence and coherence, self-compassion, attachment, and belonging, showed negative relationships with early disorder determinants, maladaptive schematic functioning, defensive maneuvers and psychological flexibility. As stated before, adaptive self-domains may be viewed as the healthy adult mode of the self that counters the difunctionally in psychological functioning caused by maladaptive schematic functioning (Young et al., 2003). The adaptive self may be defined as the part of the self that encompasses the positive schemas that result from adaptive emotional experiences in childhood (Lockwood & Perris, 2012). Thus, Faustino (in prep) theorized that schemas

are multidimensional by nature and tend to be grouped thematically, which is why self-states of mindfulness and acceptance, confidence and coherence, self-compassion, attachment, and belonging are negatively correlated with maladaptive schematic functioning and states of mind. Thus, previous research pointed in that direction, with mindfulness, acceptance and self-compassion being negatively associated with emotional schemas (Faustino et al., 2020a), early maladaptive schemas (Faustino et al., 2020b) and symptomatology (Birnie et al., 2010; Costa & Pinto-Gouveia, 2011; Raes, 2011; Gilbert, McEwan, Matos, & Rivis, 2011; Popov et al., 2016; Raque-Bogdan, et al, 2011). Taken together, this evidence may suggest that schematic work may be focused not only on schema healing but also on strengthening the healthy self, which is the part of the self that may work as an adaptive self-domain.

4. Neuroscience contributions to psychotherapy

The integration of neuroscience contributions into clinical psychology and psychotherapy is ongoing at a steady pace (Cozolino, 2017). The understanding that the brain can be viewed as the organ of the mind opens a new perspective for the exploration of how the brain sciences can enhance psychotherapy. Several researchers and authors have theorized that several neuroscience-based principles and neurocognitive processes may consolidate previous knowledge and open new avenues for new perspectives (Cozolino, 2017; Diamond, 2013; Grawe, 2007; Kandel, 1998; Lezak et al., 2014; Siege, 1999; Stuss & Knight, 2013; Tyron, 2014). From neural integration to subjective experiences, the exploration of how the brain produces psychological processes is a fascinating concept, which was one of the main driving forces of this work. The exploration of how neurocognitive processes such as executive functions, complex attention, memory and learning, perception, and language are associated with the

maladaptive schematic functioning and other variables was achieved successfully, which is considered a steady contribution to the integration of neurocognition with psychotherapy. Nevertheless, this line of research has several challenges that need to be overcome and several methodological barriers that need to be explored carefully.

Results from the present work showed that exploration and association between personality traits, (e.g., schemas, states of mind, defensive styles) based on self-report instruments, and neurocognitive processes (e.g., executive functions), based on performance-based tasks, does not suggest strong associations between these two domains. Accordingly, previous research showed that the overlapping between personality and neurocognitive processes may suffer from the lack of construct validity due to limitations regarding construct associations between self-report measures and behavioral tasks (Milyavskaya et al, 2018; Paap, et al., 2020; Wennerhold & Friese, 2020).

Despite the need for this integration, previous research showed that several constructs (e.g., behavioral inhibition) when measured with self-report instruments and performance-based tasks showvery weak or a lack of association (Eisenberg et al., 2019; Milyavskaya et al, 2018). Similar results may be found with other constructs, such as executive functions (Buchanan, 2016), self-control (Sanders et al., 2018), and attentional control (Williams, et al., 2017). Some reasons that may help understand why this phenomenon happens were emphasized previously: (1) self-report measures of dispositional traits do not capture moment-to-moment fluctuations of the manifestation of that trait, (2) individuals perform biased self-assessments of their traits; (3) construct variability and construct dimensionality may be better captured by two different assessment methods and (4) performance-based tasks are focused on a specific facet

whereas self-report instruments are focused on construct generalization (Saunders et a., 2018; Wennerhold & Friese, 2020).

Despite these challenges, clinical data is overwhelming when it comes to describing neurocognitive impairments associated with psychological disorders. Neurocognitive impairments in executive functions, attention, memory, and self-perception in individuals with anxiety, depression, substance use, and schizophrenia spectrum disorders are well documented (Airaksinen et al., 2005; Faustino et al., 2019; Doucet et al., 2020; Galandra et all., 2018; Snyder, 2013; Snyder et al., 2015; Yang et al., 2017; Yang et al., 2019;). This evidence shows that maybe a new perspective is required when it comes to assessing personality traits (e.g., schemas) and the associated neurocognitive functioning.

Furthermore, several authors have overcome this limitation with the development of several instruments focused on self or others' perceptions of an individual´s neurocognitive processes such as the BRIEF questionnaire (Guy et al., 2004), Behavioural Assessment of the Dysexecutive Syndrome (BADS; Wilson, et al., 1996), Working Memory Questionnaire (WMQ, Vallat-Azouvi et al., 2012), Everyday Attention Questionnaire (EAQ, Ray et al., 1993), Brock Adaptive Functioning Questionnaire (BAFQ, Dywan & Segalowitz, 1996), Multifactorial Memory Questionnaire (MMQ, Troyer & Rich, 2012) and Everyday Memory Questionnaire – revised (EMQ-R, Royle & Lincon, 2008). All these instruments showed satisfactory psychometric properties.

Based on this evidence, these two broad domains of human functioning may be viewed as two separate domains of assessment that should be integrated into a coherent assessment system in a complementary manner. Far from the assumption of resolution of this long-standing issue, the present perspective emphasizes the notion that: (1) two different methods of data acquisition may not have strong associations, but maybe cover significant areas associated with emotional suffering, (2) more research is required to

explore the lack of associations between self-report and performance-based tasks, (3) the inclusion of other forms of data acquisition (e.g., fMRI) may help to deepen the exploration of this phenomena (4) despite the lack of strong associations, clinical psychologists and psychotherapists should validate and explore these difficulties specifically with each singular patient, focusing on their characteristics, schemas, coping styles and needs.

EEG data also supported the theoretical claim that neuroscience research could provide steady contributions to the understanding of human functioning and inform psychological intervention. The influence of maladaptive schematic functioning and emotional processing difficulties on automatic emotional reactions was observed in correlations wherein there was a predominance of displeasure responses, which can be interpreted as being the result of an automatic attention bias, which leads to the unconscious retreat from positive stimulation.

These results imply that negative emotionality is not associated with an orientation towards stimuli with negative valence, but with a selective departure from positive stimulation. This may be due to a bias in automatic attentional processes, which selectively exclude the processing of information with positive valence. Our data show that this bias in emotional reaction (microsystem) can be the basis for the development of anxious or depressed personality patterns (macrosystem), or be an expression of these macrostructures. These results are aligned with previous investigations, where a similar pattern of unconscious avoidance of positive stimulation was associated with depressive personality (Baião, 2018).

Taken together, evidence suggests that it is possible to follow a path of theoretical integration between psychotherapy and neurosciences, not only on a conceptual and empirical level but also on a practical level. The understanding of brain processes and

their interactions with external behavior allows for several coherent theoretical elaborations that resemble the integration at a structural and deeper level of knowledge of mind, brain, and behavior. Thus, recently, based on several observations and theorizations described in the literature (Cozolino, 2017; Diamond, 2013; Grawe, 2007; Kandel, 1998; Lezak et al., 2014; Menon, 2010; Siege, 1999; Stuss & Knight, 2013; Tyron, 2014), Faustino (2021) elaborated eleven neuroscience-based principles that can be used to enhance psychotherapy responsiveness: (1) neurobiology of attachment – therapeutic relationship as a soother agent (relational-based parasympathetic activation), (2) neuronal integration of dissociated mental elements (coherent self-narratives) - promoting new experiences and self-reflection, (3) promoting interhemispheric integration – symbolizing experiences (words into feelings), (4) enhance cortico-limbic modulation – affective modulation and emotion regulation through imagery and verbal self-soothing, (5) autobiographical memory reprocessing and/or reconsolidation (activation of hippocampus and frontal-parietal associated networks), (6) promote external and internal focus of modes of processing (activation of task positive networks and the default mode network), (7) promote self-awareness and reflection of cognitive-emotional states (strengthen the cortico-limbic interaction system, bottom-up and top-down processes), (8) promote motivational self-rewards (activation of mesocorticolimbic system), (9) respect working memory and executive functioning limits (do not overload patients with different affective laden mental contents to process), (10) modulate and rehearse new behaviors (activation of mirror neurons in temporal-parietal networks) and (11) use of the consistency principle to enhance neuroplasticity, neurogenesis, and epigenetic mechanisms.

Finally, it is self-evident that there is a long path to unfold regarding the identification and understanding of how mind and brain interact and how they produce

emotions, wishes, beliefs, intentions, dreams, and observable behavior in a definite manner. The integration between psychotherapy and neuroscience is still in its infancy. With a transtheoretical, integrative, and meta-paradigmatic perspective, the present doctoral thesis focused on making a small contribution in this direction.

5. Clinical and non-clinical variables: the quest for general or disorder-specifications

In the first section of the present doctoral thesis, it was emphasized that research partially supports transtheoretical, diagnostic, and transdiagnostic perspectives, especially when it comes to the tailoring specific interventions to an individual's needs and/or diagnostic prototypical symptomatology. Transtheoretical and transdiagnostic perspectives affirm that individuals share common cognitive, affective, behavior, motivational, and neurobiological processes and mechanisms, which cross different disorders (Barlow et al., 2004; Barlow et al., 2017; Norcross, 2011). These approaches rely mostly on constructs as maladaptive schemas, psychological inflexibility, metacognition, psychological needs, motivation, coping style and reactance (Butler, 2000; Faustino & Vasco, a,b,c; Norcross & Goldfried, 2005; Norcross & Wampold, 2019; Prochaska & DiClemente; 1983; Vasco, 2005, 2018). Disorder-specific approaches tend to favor categorical and specific and standardized protocols for case conceptualization and interventions, which received a substantial amount of empirical support in the cases of generalized anxiety disorders (Cuijpers, et al., 2014), anxiety spectrum disorders (Carpenter et al., 2018), anxiety and depression (Zhang et al., 2020), depression (Cuijpers, et al., 2013; Cuijpers et al., 2020), group CBT in primary care (Santoft et al., 2019) and posttraumatic stress disorder (PTSD, Mavranezouli, et al., 2020).

As explained before, the present work did not have the aim of resolving this issue. Rather, it was focused on contributing with new evidence to this discussion. Results suggested that relationships between early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes and adaptive self-domains, have differential intensities and weights regarding the clinical criteria of >1.7 of BSI (Canavarro, 1999).

Results showed that only parenting styles and expressive suppression did not differ between the two subsamples, whereas other variables have different intensities based on their type. Dysfunctional variables had greater intensity in clinical subsample and adaptive variables had greater intensity in a non-clinical sample. The relationships between variables, in most cases, are a matter of degree/level or quantity and not of presence/absence. In this sense, a reflection emerges considering the relationship between the dimensional perspective and the categorical perspective on mental health. By observing that the relationships between the variables which facilitate symptomatology (e.g., maladaptive schemas and states of mind) are present in both subsamples, one may conclude that these variables may work on a continuum rather than in a categorical way. That is, in both subsamples, the relationships between the variables are present in terms of quantity (for example, greater correlations between schemas and inflexibility in the clinical sample).

The main question is: so where is the line that separates normality from dysfunctionality? In certain cases in which these relationships become extremely strong, quality seems to arise at the expense of a quantity, referring to the strength of the relationship between the maladaptive variables. For example, the schema of incompetence/dependence in its mild/moderate form can be potentially adaptive: if individuals are in a stress context (e.g., work, life stage) where the help of the other is

crucial, they may ask for some help to overcome a difficult situation (dimensional perspective). On the other hand, if we think in terms of dependent personality disorder, where the underlying early maladaptive schema of incompetence/dependence is extremely inflexible, generalized, and pervasive, and individuals rely excessively on the other to meet their goals and needs, it is fair to conclude that the presence of this schema is extremely dysfunctional. Another example may be given. A high standards schema in its mild/moderate form can be potentially adaptive, as an individual that possesses this schema will healthily pursue goals and objectives. However, if he has this schema in its strong/severe form, he probably has an Obsessive-Compulsive Disorder (Khosravani et al., 2017), whereby he follows rigid rules and has inflexible beliefs and high standards, promoting severe symptomatology. Therefore, the debate remains relevant according to the emerging results.

Furthermore, what these results imply is that case conceptualization and clinical decision-making should be tailored to the specificities of each person. That is, it should be the patient variables that guide this process, due to the complexity of the psychological configurations between the severity of symptomatology, dispositional traits (e.g., affective styles, schemas, and coping), contextual states (e.g., emotional difficulties, states of mind and modes) and life stages. Therefore, based on these results, I suggest that the issue of the quest for general or disorder-specifications should be resolved within each specific patient, in a commitment between psychotherapists' suggestions/actions (top-down) and individuals characteristics, styles of communication, coping styles, and needs (bottom-up). Nevertheless, more research is required to explore how these interactions would produce therapeutic leverage and momentum.

6. Exploring temporal stability of dispositional traits and contextual states: The process of change

Intrinsically related to the process of change is the notion of temporal stability, which is related with the maintenance of maladaptive mental structures and symptomatology but also with the several stages that individuals engage during the processes of change. As stated before, the discussion between dispositional traits and contextual states is ongoing, and the temporal stability of maladaptive psychological functioning is one of the major issues that lead individuals to psychotherapy, because of the chronic emotional suffering, life-long disorders, and life dissatisfaction (Faustino, 2021). This is emphasized in several theoretical orientations such as psychodynamics (Freud, 1931), behavior therapy (Wolpe, 1976) and also contemporary approaches, such as cognitive behavior therapy (Beck et al., 2003) and schema therapy (Young et al., 2003).

Results suggest that the temporal stability of dispositional traits and contextual states is not linear, which implies complex configurations between variables that should not be assumed. Also, a decreasing tendency from the first to the second moment in the mean scores of the maladaptive variables (e.g., symptomology) and an increasing tendency in the mean scores of the adaptive variables (e.g., adaptive self-states) were observed. Thus, like the previous point that I´ve made, individuals may present themselves with different configurations and constellations of dispositional traits and contextual states that, to some degree, may fluctuate in intensity, frequency, and dimensionality through time. In this sense, it is the psychotherapist's responsibility to understand and explore the specific temporal needs of each patient based on the specific moments, not only in the patient life but also in the psychotherapy stage. This is a core factor in understanding what type of sequential strategy should be used by the psychotherapist (Vasco, 2005; Vasco et al., 2018).

Furthermore, on the one hand, early maladaptive schemas, emotional schemas, defensive styles, emotional processing difficulties, cognitive reappraisal, and psychological needs showed temporal stability, which was somewhat expected (Pallard, 2007; Riso et al., 2006; Young et al., 2003) These evidences imply that these are structural psychological variables (dispositional traits), and probably, they tend not to change without deliberate actions. On the other hand, states of mind, coping strategies, and expressive suppression were shown to change across time, which is suggestive of contextual states. Therefore, taken together, these results emphasize the importance of all these variables as differentiated for case conceptualization and clinical decision-making, due to: (1) discrepancies between symptomatology, maladaptive schemas, defensive maneuvers, mental abilities, and self-states, (2) differentiation between dispositional traits and contextual states, (3) differentiation between generic coping styles and emotion coping, (4) critical variances in several constructs, (5) temporal stability on the relationship between maladaptive structures and coping variables; (6) temporal stability on the relationship between maladaptive variables and adaptive self-domains.

Moreover, these results imply that trait-state relationships interact and change through time, which may lead to difficulties in case conceptualization, intervention, process stagnations, and/or dropouts. Changes in the relationships between variables across different moments in time may be puzzling. As suggested in the previous section of this doctoral thesis, combining the complex relationships between these variables and the complexity within each variable with an approach based on the dichotomy of the state-trait approach is reductionist. Complex constructs encompass several cognitive-affective elements, such as beliefs, emotions, attributions, and/or coping styles (Faustino et al., 2021b), which require a construct responsiveness approach beyond dispositional traits and contextual states. Maybe a clinical exploration and elaboration with the patient may

help to bypass this dichotomy (agreement between therapist and patient on the tasks and goals). Therefore, more research is required to explore how to combine several process models towards the specifications of this construct.

7. Clinical Decision-Making Considerations

Clinical decision-making variables showed direct correlations with the other variables under study. This shows that these variables can be used to select psychological interventions based on specific psychological clinical profiles. Furthermore, it is possible to emphasize several clinical interventions or tasks to work differentially with these constructs. It is very difficult to isolate and/or categorize tasks with labels of cognitive, behavioral, emotional, relational tasks, because if done properly, they all have, to some degree, each of these elements.

There is a diverse set of therapeutic tasks that can be used by clinical psychologists and psychotherapists to work with early disorder determinants and maladaptive schematic functioning and states of mind. Tasks of cognitive reattribution, schema awareness and dialogues, narrative retelling, experiential reenactments, imagery reprocessing, chair work, mode or state tracking, mindfulness, focusing, behavioral experiments, and homework assignments are all compatible with a science-based approach focused on schema restructuring (Magnavita, 2013). Essentially, these tasks are focused on cognitive restructuring and relational restructuring.

Some authors suggest working with defensive maneuvers via defense awareness, mode dialogues, and exposure in imagery (Young et al., 2003), and to work with dysfunctional consequences, psychologists may use the empty chair dialogue, two-chair work, experiential focusing, metacommunication, relational pattern awareness

(Greenberg and Goldman, 2017; Saffran, 1990; Vasco et al., 2018), which are focused on defensive and coping restructuring.

To work with the development of mental abilities and processes, clinical psychologists and psychotherapists may use mentalization and metacognition focused tasks, such as comprehensive reflection, decentering, reframing, and perspective shifting (Fonagy 2000; Dimaggio et al., 2015). To promote emotion regulation, tasks of distress tolerance, emotional identification, awareness, and differentiation may also be used (Linehan, 1993). These tasks are focused on affective restructuring and emotion regulation (Magnavita, 2013).

Strategies that are focused on neurobiological restructuring tend to be focused on behavioral tasks, such as diaphragmatic breathing, grounding or progressive muscle relaxation, or imagery of safe place. Neurocognitive restructuring implies stimulation of neurocognitive functions and the development of new skills based on the limitations described in previous neurocognitive profile.

Finally, these results are elucidating of the importance of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities, and processes, and adaptive self-domains for integrative case conceptualization and clinical decision making.

8. Limitations

Despite all the assets that the present doctoral thesis may encompass, several limitations need to be described. Data was acquired with self-reported instruments, which are limited to participants' self-awareness of the given constructs. Self-reported responses were given on-line, without the presential supervision of the main researcher.

Neuropsychological assessments and EEG data collection were conducted in different parts of the day, based on the participants' availability, which may have some impacts on their cognitive performance. The exploration of the associations between neurocognitive domains and personality domains was based on specific indexes and not on the total scores that each assessment instrument provides, such as response times. Therefore, some correlations were not listed in the present study. The sample under study had many more female responders than male responders, which could have introduced biases in the results. Some individuals were engaged in psychotherapy, which may also contribute to mixed results. The type of psychotherapy was not controlled for. However, this issue will be further explored. Finally, this study was conducted with university participants that configured a non-clinical sample.

9. Future Directions

The present work left several issues unanswered, which can inform future research projects. To strengthen the study results and conclusion, several replications should be performed to observe if the results maintain the same consistency. This should be performed with different methodologies, such as self-report questionnaires, neuropsychological assessment instruments, or EEG and behavioral performance tasks. Some constructs do not have clear delimitations and/or concrete definitions, such as early maladaptive schemas, emotional schemas, or interpersonal schemas. Future efforts should be performed for construct delimitation and the development of congruent assessment measures. The exploration of the relationships between the constructs under study and other constructs (e.g., states of mind and mentalization or attachment) is required, to understand if the patterns remain the same. Some instruments used may benefit from powerful psychometric studies (e.g., Rasch Analysis, Faustino et al., 2019c), to augment

instrument quality. Also, some new instruments may also be elaborated based on other constructs, such as mentalization, transference, or stage challenges. Several complementarity studies with other methodologies such as fMRI and/or biomarkers may also be useful especially to disentangle moment-to-moment emotional activations and self-report perceptions of emotional states. Finally, the exploration of the relationships of the variables under study in clinical samples is also required.

10. Conclusions

The aims of the present doctoral thesis were achieved. The present work was able to document several relationships of early disorder determinants, maladaptive schematic functioning and states of mind, defensive maneuvers and dysfunctional consequences, mental abilities and processes, and adaptive self-domains with several neurocognitive variables, psychophysiological variables in a cross-sectional and longitudinal design. Results suggest that there are multiple relationships between dysfunctional and functional dispositional traits and contextual states that are related to neurocognition and psychophysiological variables with contextual and temporal stability. Therefore, based on these preliminary results, the proposed model adopts all these core variables and their relationships as foundational and structural elements for case conceptualization and clinical decision-making. This research is not the end but the beginning. Therefore, more research is required to deepen and replicate, support, and explore these findings.

REFERENCES

Adam, R., Schönfelder, S., Forneck, J., & Wessa, M. (2014). Regulating the blink: Cognitive reappraisal modulates attention. *Frontiers in psychology*, *5*, 143. https://doi.org/10.3389/fpsyg.2014.00143

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, *30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

Almeida. V. B. F. (2015). Uma Proposta Integradora de Intervenção na Disfunção Executiva: Relações entre as Funções Executivas a Personalidade e o Funcionamento Esquemático. [An Integrative Proposal for Intervention in Executive Dysfunction: Relationships between Executive Functions, Personality and Schematic Functioning.] Dual-Postgraduate Degree. Instituto Português de Psicologia.

Almeida. V. B. F. (2016). Funcionamento Esquemático, Ciclos Interpessoais Disfuncionais e Fusão Cognitiva na Perspetiva do Modelo de Complementariedade Paradigmática. [Schematic functioning, interpersonal dysfunctional cycles, and cognitive fusion in the complementary paradigmatic perspective.] Master thesis in Faculty of Psychology of University of Lisbon. http://hdl.handle.net/10451/26650

Almeida. V. B. F. (2018). Características Psicométricas do Wisconsin Card Sorting Test em Várias Amostras da População Portuguesa [Psychometric characteristics of the Wisconsin Card Sorting Test in several samples of the Portuguese Population.] Master thesis in Faculty of Psychology and Life Sciences of Lusophone Humanities and Technologies University. http://hdl.handle.net/10437/9419

Airaksinen, E., Larsson, M., & Forsell, Y. (2005). Neuropsychological functions in anxiety disorders in population-based samples: evidence of episodic memory dysfunction. *Journal of psychiatric research*, *39*(2), 207–214. https://doi.org/10.1016/j.jpsychires.2004.06.001

Airaksinen, E., Larsson, M., & Forsell, Y. (2005). Neuropsychological functions in anxiety disorders in population-based samples: evidence of episodic memory dysfunction. *Journal of psychiatric research*, *39*(2), 207–214. https://doi.org/10.1016/j.jpsychires.2004.06.001

American Professional Society on the Abuse of Children. (1995). *American Professional Society on the Abuse of Children. Guidelines for Psychosocial Evaluation of Suspected Psychological Maltreatment in Children and Adolescents.* Chicago, IL.

Andrews G, Singh M, & Bond M (1993). The Defense Style Questionnaire. *Journal of Nervous and Mental Disease, 181*, 246-256

Andrews-Hanna, J. R., Smallwood, J., & Spreng, R. N. (2014). The default network and self-generated thought: component processes, dynamic control, and clinical relevance. *Annals of the New York Academy of Sciences*, *1316*(1), 29–52. https://doi.org/10.1111/nyas.12360

Andreou C., Leicht G., Popescu V., Pogarell O., Mavrogiorgou P., Rujescu D., et al. . (2013). P300 in obsessive-compulsive disorder: source localization and the effects of treatment. J. Psychiatr. Res. 47, 1975–1983. 10.1016/j.jpsychires.2013.09.003

Anastasi, A., & Urbina, S. (1997). *Psychological testing* (7th ed.). Prentice Hall/Pearson Education.

Arntz, A., Klokman, J., & Sieswerda, S. (2005). An experimental test of the schema mode model of borderline personality disorder. *Journal of behavior therapy and experimental psychiatry*, *36*(3), 226–239. https://doi.org/10.1016/j.jbtep.2005.05.005

Assary, E., Vincent, J. P., Keers, R., & Pluess, M. (2018). Gene-environment interaction and psychiatric disorders: Review and future directions. *Seminars in cell & developmental biology*, *77*, 133–143. https://doi.org/10.1016/j.semcdb.2017.10.016

Avinun, R., & Knafo, A. (2014). Parenting as a reaction evoked by children's genotype: a meta-analysis of children-as-twins studies. *Personality and social psychology review: an official journal of the Society for Personality and Social Psychology, Inc*, *18*(1), 87–102. https://doi.org/10.1177/1088868313498308

Baddeley, A. (2007). *Oxford psychology series: Vol. 45. Working memory, thought, and action.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198528012.001.0001

Bach, B., Lockwood, G., & Young, J. E. (2017). A new look at the schema therapy model: Organization and role of early maladaptive schemas. *Cognitive Behaviour Therapy*. https ://doi. org/10.1080/16506 073.2017.14105 66.

Baddeley, A. D., & Hitch, G. J. (1974). Working memory. In *The Psychology of Learning and Motivation: Advances in Research and Theory*, ed. GA Bower, pp. 47–89. New York: Academic

Baião. M. (2018). Reatividade Emocional e Padrões Afetivos: Estudo das relações entre a reação não-conscientes estímulos emocionais e as variáveis afetivas. [Emotional Reactivity and Affective Patterns: Study of relations between non-conscious reaction emotional stimuli and affective variables.] Master thesis in Faculty of Psychology of University of Lisbon.

Balderston, N. L., Vytal, K. E., O'Connell, K., Torrisi, S., Letkiewicz, A., Ernst, M., & Grillon, C. (2017). Anxiety Patients Show Reduced Working Memory Related dlPFC Activation During Safety and Threat. *Depression and anxiety*, *34*(1), 25–36. https://doi.org/10.1002/da.22518

Balsamo, M., Carlucci, L., Sergi, M. R., Klein Murdock, K., & Saggino, A. (2015). The Mediating Role of Early Maladaptive Schemas in the Relation between Co-Rumination and Depression in Young Adults. *PloS one*, *10*(10), e0140177. https://doi.org/10.1371/journal.pone.0140177

Baker, R., Thomas, S., Thomas, P. W., Gower, P., Santonastaso, M., & Whittlesea, A. (2010). The Emotional Processing Scale: scale refinement and abridgement (EPS-

25). *Journal of psychosomatic research*, *68*(1), 83–88. https://doi.org/10.1016/j.jpsychores.2009.07.007

Bamelis, L. L., Renner, F., Heidkamp, D., & Arntz, A. (2011). Extended Schema Mode conceptualizations for specific personality disorders: an empirical study. *Journal of personality disorders*, *25*(1), 41–58. https://doi.org/10.1521/pedi.2011.25.1.41

Bandura, A. (1971) *Social Learning Theory*. General Learning Press, New York.

Bardeen, J. R., & Fergus, T. A. (2016). Emotional distress intolerance, experiential avoidance, and anxiety sensitivity: The buffering effect of attentional control on associations with posttraumatic stress symptoms. *Journal of Psychopathology and Behavioral Assessment, 38*(2), 320–329. https://doi.org/10.1007/s10862-015-9522-x

Barreira, J. (2016). Relações entre dificuldades de processamento emocional, regulação emocional, necessidades psicológicas, sintomatologia e bem-estar/distress. [Relationship between emotional processing difficulties, emotional regulation, psychological needs, symptomatology and well-being/distress.] Master thesis in Faculty of Psychology of University of Lisbon.

Barlow, D. H. (2014). The Neuroscience of Psychological treatments. *Behaviour Research and Therapy*, 62, 143-145. Doi: https://doi.org/10.1016/j.brat.2014.09.003

Barlow, D. H. (Ed.). (2014). *Clinical handbook of psychological disorders: A step-by-step treatment manual* (5th ed.). The Guilford Press.

Barlow, D. H., Allen, L. B., & Choate, M. L. (2004). Toward a Unified Treatment for Emotional Disorders. *Behavior Therapy, 35*(2), 205–230. https://doi.org/10.1016/S0005-7894(04)80036-4

Barlow, D. H., Farchione, T. J., Bullis, J. R., Gallagher, M. W., Murray-Latin, H., Sauer-Zavala, S., Bentley, K. H., Thompson-Hollands, J., Conklin, L. R.,

Boswell, J. F., Ametaj, A., Carl, J. R., Boettcher, H. T., & Cassiello-Robbins, C. (2017). The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders Compared With Diagnosis-Specific Protocols for Anxiety Disorders: A Randomized Clinical Trial. *JAMA psychiatry*, *74*(9), 875–884. https://doi.org/10.1001/jamapsychiatry.2017.2164

Bartlett, F. C. (1932). *Remembering: A study in experimental and social psychology. Cambridge*, UK: Cambridge University Press.

Bartlett, F. C. (1958). *Thinking: An experimental and social study*. London, UK: George Allen & Unwin.

Basso, L. A., Fortes, A. B., Maia, C., Steinhorst, E., & Wainer, R. (2019). The effects of parental rearing styles and early maladaptive schemas in the development of personality: a systematic review. *Trends in psychiatry and psychotherapy*, *41*(3), 301–313. https://doi.org/10.1590/2237-6089-2017-0118

Bateman, A., & Fonagy, P. (2010). Mentalization based treatment for borderline personality disorder. *World psychiatry: official journal of the World Psychiatric Association (WPA)*, *9*(1), 11–15. https://doi.org/10.1002/j.2051-5545.2010.tb00255.x

Bateman, A., & Fonagy, P. (2013). Mentalization-Based Treatment. *Psychoanalytic inquiry*, *33*(6), 595–613. https://doi.org/10.1080/07351690.2013.835170

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *The Journal of Early Adolescence, 11*(1), 56–95. https://doi.org/10.1177/0272431691111004

Beck, A. T. (1979). *Cognitive therapy and the emotional disorders*. New York: International. Universities Press. Paperbound edition published by New American Library, New York, 1979

Beck, A. T., Rush, A., Shaw, B., & Emery, G. (1979). *Cognitive Therapy of Depression*. New York: The Guilford Press.

Beck, A. T., Freeman, A., & Davis, D. D. (2004). *Cognitive therapy of personality disorders* (2nd ed.). New York: Guilford Press.

Beck, J. S. (2011). *Cognitive behavior therapy: Basics and beyond* (2nd ed.). Guilford Press.

Behnken, A., Schöning, S., Gerss, J., Konrad, C., de Jong-Meyer, R., Zwanzger, P., & Arolt, V. (2010). Persistent non-verbal memory impairment in remitted major depression - caused by encoding deficits?. *Journal of affective disorders*, *122*(1-2), 144–148. https://doi.org/10.1016/j.jad.2009.07.010

Beitman, B. D. (1987). *The structure of individual psychotherapy.* Guilford Press.

Bernardes, A. C. (2017). A reatividade emocional não-consciente: estudo exploratório sobre a influência de variáveis da personalidade e do treino de meditação. [Non-conscious emotional reactivity: an exploratory study on the influence of personality variables and meditation training.] Master thesis in Faculty of Psychology of University of Lisbon. http://hdl.handle.net/10451/32918

Bernstein, D. P., Ahluvalia, T., Pogge, D., & Handelsman, L. (1997). Validity of the Childhood Trauma Questionnaire in an adolescent psychiatric population. *Journal of the American Academy of Child & Adolescent Psychiatry, 36*(3), 340–348. https://doi.org/10.1097/00004583-199703000-00012

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child abuse & neglect*, *27*(2), 169–190. https://doi.org/10.1016/s0145-2134(02)00541-0

Benjamin, L. S. (1974). Structural analysis of social behavior. *Psychological Review, 81,* 392-425.

Benjamin, L.S. (2006). *Interpersonal reconstructive therapy: An integrative personality-based treatment for complex cases.* New York, NY: Guilford Press.

Benjamin, L.S. (2010). Structural analysis of social behavior and the nature of nature. In S. Strack & L. Horowitz (Eds.), *Handbook of interpersonal psychology: Theory, research, assessment, and therapeutic interventions* (pp. 325–341). New York, NY: Wiley.

Benjamin, L.S. (2018). *Interpersonal reconstructive therapy for anger, anxiety and depression: It's about broken hearts, not broken brains.* Washington, DC: American Psychological Association.

Betjemann, R. S., Johnson, E. P., Barnard, H., Boada, R., Filley, C. M., Filipek, P. A., Willcutt, E. G., DeFries, J. C., & Pennington, B. F. (2010). Genetic covariation between brain volumes and IQ, reading performance, and processing speed. *Behavior genetics*, *40*(2), 135–145. https://doi.org/10.1007/s10519-009-9328-2

Beutler, L. E., Consoli, A. J., & Lane, G. (2005). *Systematic Treatment Selection and Prescriptive Psychotherapy.* In J. C. Norcross & M. R. Goldfried (Eds.), *Oxford series in clinical psychology. Handbook of psychotherapy integration* (p. 121–143). Oxford University Press. https://doi.org/10.1093/med:psych/9780195165791.003.0006

Beutler, L. E., Harwood, T. M., Kimpara, S., Verdirame, D., & Blau, K. (2011). Coping style. *Journal of clinical psychology*, *67*(2), 176–183. https://doi.org/10.1002/jclp.20752

Beutler, L. E., Edwards, C., & Someah, K. (2018). Adapting psychotherapy to patient reactance level: A meta-analytic review. *Journal of clinical psychology*, *74*(11), 1952–1963. https://doi.org/10.1002/jclp.22682

Bierer, L. M., Yehuda, R., Schmeidler, J., Mitropoulou, V., New, A. S., Silverman, J. M., & Siever, L. J. (2003). Abuse and neglect in childhood: relationship to personality

disorder diagnoses. *CNS spectrums*, *8*(10), 737–754. https://doi.org/10.1017/s1092852900019118

Birnie, K., Speca, M., & Carlson, L. E. (2010). Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health: Journal of the International Society for the Investigation of Stress, 26*(5), 359–371. https://doi.org/10.1002/smi.1305

Blatt, S. J. (2008). *Polarities of experience: Relatedness and self-definition in personality development, psychopathology, and the therapeutic process.* American Psychological Association. https://doi.org/10.1037/11749-000

Blokland, G. A., McMahon, K. L., Thompson, P. M., Martin, N. G., de Zubicaray, G. I., & Wright, M. J. (2011). Heritability of working memory brain activation. *The Journal of neuroscience: the official journal of the Society for Neuroscience*, *31*(30), 10882–10890. https://doi.org/10.1523/JNEUROSCI.5334-10.2011

Booth, J., Ireland, J. L., Mann, S., Eslea, M., & Holyoak, L. (2017). Anger expression and suppression at work: Causes, characteristics and predictors. *International Journal of Conflict Management, 28*(3), 368–382. https://doi.org/10.1108/IJCMA-06-2016-0044

Bo, S., Kongerslev, M., Dimaggio, G., Lysaker, P. H., & Abu-Akel, A. (2015). Metacognition and general functioning in patients with schizophrenia and a history of criminal behavior. *Psychiatry Research, 225*(3), 247–253. https://doi.org/10.1016/j.psychres.2014.12.034

Bowlby, J. (1979). On Knowing what you are Not Supposed to Know and Feeling what you are Not Supposed to Feel. *The Canadian Journal of Psychiatry, 24*(5), 403–408. https://doi.org/10.1177/070674377902400506

Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry, 52*(4), 664–678. https://doi.org/10.1111/j.1939-0025.1982.tb01456.x

Boldrini, M., Fulmore, C. A., Tartt, A. N., Simeon, L. R., Pavlova, I., Poposka, V., Rosoklija, G. B., Stankov, A., Arango, V., Dwork, A. J., Hen, R., & Mann, J. J. (2018). Human Hippocampal Neurogenesis Persists throughout Aging. *Cell stem cell*, *22*(4), 589–599.e5. https://doi.org/10.1016/j.stem.2018.03.015

Buss, D. M. (1995). Evolutionary psychology: A new paradigm for psychological science. *Psychological Inquiry, 6*(1), 1–30. https://doi.org/10.1207/s15327965pli0601_1

Buss, D. M. (2011) *Evolutionary psychology: The new science of the mind*, 4th edition. Allyn & Bacon.

Buss, A.H., & Plomin, R. (1975) *A temperament theory of personality development*. New York: Wiley.

Buchheim, A., Labek, K., Viviani, R., Taubner, S., Kessler, H., Kächel, H., Cierpka, M., Roth, G., Pogarell, O., & Karch, S. (2016). Neural changes in depressed patients during psychodynamic psychotherapy: an fMRI and EEG study using an attachment paradigm. *Unpublished Work.*

Burt. S. A. (2008). Gene-environment interactions and their impact on the development of personality traits, *Psychiatry, 7*, pp. 507-510. https://doi.org/10.1016/j.mppsy.2008.10.005

Burton, M. S., Feeny, N. C., Connell, A. M., & Zoellner, L. A. (2018). Exploring evidence of a dissociative subtype in PTSD: Baseline symptom structure, etiology, and treatment efficacy for those who dissociate. *Journal of consulting and clinical psychology*, *86*(5), 439–451. https://doi.org/10.1037/ccp0000297

Button, T. M., Corley, R. P., Rhee, S. H., Hewitt, J. K., Young, S. E., & Stallings, M. C. (2007). Delinquent peer affiliation and conduct problems: A twin study. *Journal of abnormal psychology*, *116*(3), 554–564. https://doi.org/10.1037/0021-843X.116.3.554

Brody A. L., Saxena, S., Stoessel, P. (2001). Regional brain metabolic changes in patients with major depression treated with either paroxetine or interpersonal therapy. *Arch Gen Psychiatry* 58:631–640.

Broadbent, D. E. (1958). *Perception and Communication London:* Pergamon.

Broyd, S. J., Demanuele, C., Debener, S., Helps, S. K., James, C. J., & Sonuga-Barke, E. J. (2009). Default-mode brain dysfunction in mental disorders: a systematic review. *Neuroscience and biobehavioral reviews*, *33*(3), 279–296. https://doi.org/10.1016/j.neubiorev.2008.09.002

Brownell, P. (2010). *Gestalt therapy: A guide to contemporary practice.* Springer Publishing Co.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: Guilford

Brown, J. M., Selth, S., Stretton, A., & Simpson, S. (2016). Do dysfunctional coping modes mediate the relationship between perceived parenting style and disordered eating behaviours? *Journal of Eating Disorders, 4,* Article 27.

Buckner, R. L., & DiNicola, L. M. (2019). The brain's default network: updated anatomy, physiology and evolving insights. *Nature reviews. Neuroscience*, *20*(10), 593–608. https://doi.org/10.1038/s41583-019-0212-7

Cacioppo, J. T., & Berntson, G. G. (1992). Social psychological contributions to the decade of the brain: Doctrine of multilevel analysis. *American Psychologist, 47*(8), 1019–1028. https://doi.org/10.1037/0003-066X.47.8.1019

Cacioppo, J. T., & Freberg, L. A. (2013). *Discovering psychology: The science of the mind*. Boston, MA: Cengage.

Cacioppo, J. T., Berntson, G. G., Sheridan, J. F., & McClintock, M. K. (2000). Multilevel integrative analyses of human behavior: social neuroscience and the

complementing nature of social and biological approaches. *Psychological bulletin*, *126*(6), 829–843. https://doi.org/10.1037/0033-2909.126.6.829

Cacioppo, J. T., Berntson, G. G., & Decety, J. (2010). Social neuroscience and its relationship to social psychology. *Social cognition*, *28*(6), 675–685. https://doi.org/10.1521/soco.2010.28.6.675

Cacioppo, J. T., Hawkley, L. C., Norman, G. J., & Berntson, G. G. (2011). Social isolation. *Annals of the New York Academy of Sciences*, *1231*(1), 17–22. https://doi.org/10.1111/j.1749-6632.2011.06028.x

Callesen, P., Capobianco, L., Heal, C., Juul, C., Find Nielsen, S., & Wells, A. (2019). A Preliminary Evaluation of Transdiagnostic Group Metacognitive Therapy in a Mixed Psychological Disorder Sample. *Frontiers in psychology*, *10*, 1341. https://doi.org/10.3389/fpsyg.2019.01341

Camara, M. & Calvete. E. (2012). Cognitive schemas predicting anxiety and depressive symptoms: the role of dysfunctional coping strategies. *European. Psychiatry, 27*:1. Doi: https://doi.org/10.1016/S0924-9338(12)74289-X

Cameron, H. A., & Glover, L. R. (2015). Adult neurogenesis: beyond learning and memory. *Annual review of psychology*, *66*, 53–81. https://doi.org/10.1146/annurev-psych-010814-015006

Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., Taylor, A., & Poulton, R. (2002). Role of genotype in the cycle of violence in maltreated children. *Science (New York, N.Y.)*, *297*(5582), 851–854. https://doi.org/10.1126/science.1072290

Castelo-Branco, M. (2016). Relações entre regulação emocional, regulação da satisfação das necessidades psicológicas, bem-estar/distress psicológicos e sintomatologia. [Relationships between emotional regulation, regulation of the satisfaction of psychological needs, psychological well-being/distress and symptomatology]. Master thesis in Faculty of Psychology of University of Lisbon.

Castonguay L. G. (2011). Psychotherapy, psychopathology, research and practice: pathways of connections and integration. *Psychotherapy research: journal of the Society for Psychotherapy Research*, *21*(2), 125–140. https://doi.org/10.1080/10503307.2011.563250

Castonguay, L. G., & Beutler, L. E. (2006). Principles of therapeutic change: a task force on participants, relationships, and techniques factors. *Journal of clinical psychology*, *62*(6), 631–638. https://doi.org/10.1002/jclp.20256

Castonguay, L.G., Newman, M.G., & Grosse Holtforth, M. (2019). Cognitive-behavior assimilative integration. In J.C. Norcross & M.R. Goldfried (Eds). *Handbook of Psychotherapy Integration* (New York, NY: Oxford University Press. doi: 10.1093/med-psych/9780190690465.003.0020

Castonguay, L. G., Constantino, M. J. & Xiao, H. (2019). Integrating research and practice. In J. C. Norcross & M. R. Goldfried (Eds.), *Handbook of Psychotherapy Integration* (3rdEd., pp. 432-447). New York, NY: Oxford University Press. doi: 10.1093/med-psych/9780190690465.003.0020

Canavarro, M. C. (1999). Inventário de sintomas psicopatológicos – BSI. In M. R. Simões, M. Gonçalves, L. S. Almeida (Eds.), *Testes e Provas Psicológicas em Portugal* (Vol. II, pp.95-109). Braga: APPORT/SHO. [Inventory of psychopathological problems]

Cannon, T. D., Mednick, S. A., & Parnas, J. (1990). Antecedents of predominantly negative and predominantly positive schizophrenia in a high-risk population. *Archives of General Psychiatry, 47*:622-632.

Cadoret, R.J., Troughton, E., Bagford, J. & Woodworth. G. (1990). Genetic and environmental factors in adoptee antisocial personality. *European archives of psychiatry and neurological sciences, 239,* 231–240 https://doi.org/10.1007/BF01738577

Carpenter, J. K., Andrews, L. A., Witcraft, S. M., Powers, M. B., Smits, J., & Hofmann, S. G. (2018). Cognitive behavioral therapy for anxiety and related disorders: A

meta-analysis of randomized placebo-controlled trials. *Depression and anxiety*, *35*(6), 502–514. https://doi.org/10.1002/da.22728

Castro, S. L., Cunha, L. S., & Martins, L. (2000). Teste Stroop Neuropsicológico em Português. *Série Avaliação Psicológica*. LFA3, 0-8

Clarke, L., Bechara, A., Damasio, H., Aitken, H. R., Sahakian, B. J. & Robbins, T. W. (2008). Differential effects of insular and ventromedial prefrontal cortex lesions on risky decision-making. *Brain,* 131. 1311-1322.

Cloninger C. R. (2013). What makes people healthy, happy, and fulfilled in the face of current world challenges? *Mens sana monographs*, *11*(1), 16–24. https://doi.org/10.4103/0973-1229.109288

Cloninger, C. R., & Cloninger, K. M. (2011). Person-centered Therapeutics. *International journal of person-centered medicine*, *1*(1), 43–52. https://doi.org/10.5750/ijpcm.v1i1.21

Cloninger, C. R., Cloninger, K. M., Zwir, I., & Keltikangas-Järvinen, L. (2019). The complex genetics and biology of human temperament: a review of traditional concepts in relation to new molecular findings. *Translational psychiatry*, *9*(1), 290. https://doi.org/10.1038/s41398-019-0621-4

Chiang. M-C., Barysheva, M., Shattuck, D. W., Lee, A. D., Madsen, S. K., Avedissian, C., Klunder, A. D., Toga, A. W., McMahon, K. L., Zubicaray, G. I., Wright, M. J., Srivastava, A., Balov, N. & Thomson, P. M. (2009). Genetics of brain fiber architecture and intellectual performance. *Journal of Neuroscience, 29*:2212–2224.

Chun, M. M., & Turk-Browne, N. B. (2007). Interactions between attention and memory. *Current opinion in neurobiology*, *17*(2), 177–184.https://doi.org/10.1016/j.conb.2007.03.00

Cisler, J. M., Olatunji, B. O., Feldner, M. T., & Forsyth, J. P. (2010). Emotion Regulation and the Anxiety Disorders: An Integrative Review. *Journal of psychopathology and behavioral assessment*, *32*(1), 68–82. https://doi.org/10.1007/s10862-009-9161-1

Cohen, L. J., Tanis, T., Ardalan, F., Yaseen, Z., & Galynker, I. (2016). Maladaptive interpersonal schemas as sensitive and specific markers of borderline personality disorder among psychiatric inpatients. *Psychiatry research*, *242*, 395–403. https://doi.org/10.1016/j.psychres.2016.06.007

Conde, E. (2012). Regulação da satisfação de necessidades psicológicas: Influência no bem-estar e distress psicológicos e na sintomatologia de acordo com o modelo de complementaridade paradigmática. [Regulation of satisfaction of psychological needs: Influence on psychological well-being and distress and symptomatology according to the paradigmatic complementarity metamodel]. Master thesis in Faculty of Psychology of University of Lisbon.

Conceição, N. & Vasco, A. B. (2005). Olhar para as necessidades do *Self* como o boi olha para um palácio: Perplexidades e Fascínio. *Psychologica*. 40, 11-36. [Look at the needs of the Self as the ox looks at a palace: Perplexities and Fascination]

Constantino, M. J., Vîslaˇ, A., Coyne, A. E., & Boswell, J. F. (2019) Outcome expectation. In J. C. Norcross & M. J. Lambert (Eds.), *Psychotherapy relationships that work: Vol.1.Evidence-based transdiagnostic responsiveness* (3rd ed.) New York, NY: Oxford University Press, Inc

Corrow, S. L., Dalrymple, K. A., & Barton, J. J. (2016). Prosopagnosia: current perspectives. *Eye and brain*, *8*, 165–175. https://doi.org/10.2147/EB.S92838

Costa, J., & Pinto-Gouveia, J. (2011). The mediation effect of experiential avoidance between coping and psychopathology in chronic pain. *Clinical psychology & psychotherapy*, *18*(1), 34–47. https://doi.org/10.1002/cpp.699

Costa, V. D., & Averbeck, B. B. (2015). Frontal-parietal and limbic-striatal activity underlies information sampling in the best choice problem. *Cerebral cortex (New York, N.Y. : 1991)*, *25*(4), 972–982. https://doi.org/10.1093/cercor/bht286

Cowan N. (2008). What are the differences between long-term, short-term, and working memory?. *Progress in brain research*, *169*, 323–338. https://doi.org/10.1016/S0079-6123(07)00020-9

Cozolino, L. (2010). The Neuroscience of Psychotherapy: Healing the social brain (Second Edition) (2nd ed.). New York: W. W. Norton & Company.

Cozolino, L. (2017). The Neuroscience of Psychotherapy: Healing the social brain (Third Edition) (2nd ed.). New York: W. W. Norton & Company.

Cramer, P. (1998). Defensiveness and defense mechanisms. *Journal of Personality*, *66*, 879–894.

Critchley, H. D., Mathias, C. J., & Dolan, R. J. (2002). Fear conditioning in humans: the influence of awareness and autonomic arousal on functional neuroanatomy. *Neuron*, *33*(4), 653-663.

Croft, J., Heron, J., Teufel, C., Cannon, M., Wolke, D., Thompson, A., Houtepen, L., & Zammit, S. (2019). Association of Trauma Type, Age of Exposure, and Frequency in Childhood and Adolescence With Psychotic Experiences in Early Adulthood. *JAMA psychiatry*, *76*(1), 79–86. https://doi.org/10.1001/jamapsychiatry.2018.3155

Cuijpers, P., Berking, M., Andersson, G., Quigley, L., Kleiboer, A., & Dobson, K. S. (2013). A meta-analysis of cognitive-behavioural therapy for adult depression, alone and in comparison with other treatments. *Canadian journal of psychiatry. Revue canadienne de psychiatrie*, *58*(7), 376–385. https://doi.org/10.1177/070674371305800702

Cuijpers, P., Sijbrandij, M., Koole, S., Huibers, M., Berking, M., & Andersson, G. (2014).

Psychological treatment of generalized anxiety disorder: a meta-analysis. *Clinical psychology review*, *34*(2), 130–140. https://doi.org/10.1016/j.cpr.2014.01.002

Cuijpers, P., Karyotaki, E., de Wit, L., & Ebert, D. D. (2020). The effects of fifteen evidence-supported therapies for adult depression: A meta-analytic review. *Psychotherapy research: journal of the Society for Psychotherapy Research*, *30*(3), 279–293. https://doi.org/10.1080/10503307.2019.1649732

Cyniak-Cieciura, M., & Zawadzki, B. (2019). The Relationship Between Temperament Traits and Post-Traumatic Stress Disorder Symptoms and Its Moderators: Meta-Analysis and Meta-Regression. *Trauma, violence & abuse*, 1524838019876702. Advance online publication. https://doi.org/10.1177/1524838019876702

Dadomo, H., Panzeri, M., Caponcello, D., Carmelita, A., & Grecucci, A. (2018). Schema therapy for emotional dysregulation in personality disorders: a review. *Current opinion in psychiatry*, *31*(1), 43–49. https://doi.org/10.1097/YCO.0000000000000380

Dalsklev, M., Cunningham, T., Dempster, M., & Hanna, D. (2019). Childhood Physical and Sexual Abuse as a Predictor of Reoffending: A Systematic Review. *Trauma, violence & abuse*, 1524838019869082. Advance online publication. https://doi.org/10.1177/1524838019869082

Damasio, A. R., & Damasio, H. (1994). *Cortical systems for retrieval of concrete knowledge: The convergence zone framework.* In C. Koch & J. L. Davis (Eds.), *Computational neuroscience. Large-scale neuronal theories of the brain* (p. 61–74). The MIT Press.

Damasio, A. R. (1998). Emotion in the perspective of an integrated nervous system. *Brain Research Reviews, 26*(2-3), 83–86. https://doi.org/10.1016/S0165-0173(97)00064-7

Darling, N., & Steinberg, L. (1993). Parenting style as context: An integrative model. *Psychological Bulletin, 113*(3), 487–496. https://doi.org/10.1037/0033-2909.113.3.487

D'Avanzato, C., Joormann, J., Siemer, M., & Gotlib, I. H. (2013). Emotion regulation in depression and anxiety: Examining diagnostic specificity and stability of strategy use. *Cognitive Therapy and Research, 37*(5), 968–980. https://doi.org/10.1007/s10608-013-9537-0

Davidson, R. J., & McEwen, B. S. (2012). Social influences on neuroplasticity: stress and interventions to promote well-being. *Nature neuroscience*, *15*(5), 689–695. https://doi.org/10.1038/nn.3093

Davis, M., Bilms, J., & Suveg, C. (2017). In Sync and in Control: A Meta-Analysis of Parent-Child Positive Behavioral Synchrony and Youth Self-Regulation. *Family process*, *56*(4), 962–980. https://doi.org/10.1111/famp.12259

Davoodi, E., Wen, A., Dobson, K. S., Noorbala, A. A., Mohammadi, A., & Farahmand, Z. (2018). Early maladaptive schemas in depression and somatization disorder. *Journal of affective disorders*, *235*, 82–89. https://doi.org/10.1016/j.jad.2018.04.017

Deary, I. J., Spinath, F. M., & Bates, T. C. (2006). Genetics of intelligence. *European journal of human genetics: EJHG*, *14*(6), 690–700. https://doi.org/10.1038/sj.ejhg.5201588

Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268. doi: https://doi.org/10.1207/S15327965PLI1104_01

Dehaene, S., Changeux, J. P., Naccache, L., Sackur, J., & Sergent, C. (2006). Conscious, preconscious, and subliminal processing: a testable taxonomy. *Trends in cognitive sciences*, *10*(5), 204–211. https://doi.org/10.1016/j.tics.2006.03.007

Dell P. F., O'Neil J. A. E. (2009). Dissociation and the dissociative disorders: DSM-V and beyond. (New York, NY, US: Routledge/Taylor & Francis Group).

De Luca, R., Calabrò, R. S., & Bramanti, P. (2018). Cognitive rehabilitation after severe acquired brain injury: current evidence and future directions. *Neuropsychological rehabilitation*, *28*(6), 879–898. https://doi.org/10.1080/09602011.2016.1211937

Demarzo, M. M., Montero-Marin, J., Cuijpers, P., Zabaleta-del-Olmo, E., Mahtani, K. R., Vellinga, A., Vicens, C., López-del-Hoyo, Y., & García-Campayo, J. (2015). The Efficacy of Mindfulness-Based Interventions in Primary Care: A Meta-Analytic Review. *Annals of family medicine*, *13*(6), 573–582. https://doi.org/10.1370/afm.1863

Diamond A. (2013). Executive functions. *Annual review of psychology*, *64*, 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Dias, A., Sales, L., Carvalho, A., Castro-Vale, I., Kleber, R.J., & Mota-Cardoso, R. (2013). Estudo de propriedades psicométricas do Questionário de Trauma de Infância---Versão breve numa amostra portuguesa não clínica. *Laboratório de Psicologia,11*, 103120. http://dx.doi.org/10.14417/lp.11.2.713

Dimaggio, G., & Lysaker, P. H. (2010). *Metacognition and severe adult mental disorders: From basic research to treatment*. London, UK: Routledge

Dimaggio, G., Semerari, A., Carcione, A., Nicolo, G., & Procacci, M. (2007). *Psychotherapy of personality disorders: Metacognition, states of mind and interpersonal cycles*. London: Routledge

Dimaggio, G., Montano, A., Popolo, R., & Salvatore, G. (2015). Metacognitive interpersonal therapy for personality disorders: A treatment manual. London: Routeledge.

Dichter, G. S., Felder, J. N., & Smoski, M. J. (2011). The Effects of Brief Behavioral Activation Therapy for Depression on Cognitive Control in Affective Contexts:

an fMRI investigation. *Journal of Affective Disorders, 126*(1-2): 236–244. doi: 10.1016/j.jad.2010.03.022

Dick D. M. (2011). Gene-environment interaction in psychological traits and disorders. *Annual review of clinical psychology*, *7*, 383–409. https://doi.org/10.1146/annurev-clinpsy-032210-104518

Dranovsky, A., Picchini, A. M., Moadel, T., Sisti, A. C., Yamada, A., Kimura, S., Leonardo, E. D., & Hen, R. (2011). Experience dictates stem cell fate in the adult hippocampus. *Neuron*, *70*(5), 908–923. https://doi.org/10.1016/j.neuron.2011.05.022

Driscoll, M. P. (1994). *Psychology of learning for instruction.* Allyn & Bacon.

Douglas, R. J., & Pribram, K. H. (1969). Distraction and habituation in monkeys with limbic lesions. *Journal of Comparative and Physiological Psychology, 69*(3), 473–480. https://doi.org/10.1037/h0028163

Doucet, G. E., Janiri, D., Howard, R., O'Brien, M., Andrews-Hanna, J. R., & Frangou, S. (2020). Transdiagnostic and disease-specific abnormalities in the default-mode network hubs in psychiatric disorders: A meta-analysis of resting-state functional imaging studies. *European psychiatry: the journal of the Association of European Psychiatrists*, *63*(1), e57. https://doi.org/10.1192/j.eurpsy.2020.57

Dubois, D. J., Martin, R. A., & Bieling, P. B. (2009). Early maladaptive schemas and adaptive styles of humor. *Cognitive Therapy,33,* 585–596.

Dudley, R., Kuyken, W., & Padesky, C. A. (2011). Disorder specific and trans-diagnostic case conceptualisation. *Clinical psychology review*, *31*(2), 213–224. https://doi.org/10.1016/j.cpr.2010.07.005

DuRousseau, D. R., & Beeton, T. A. (2015). System level spatial-frequency EEG changes coincident with a 90-day cognitive-behavioral therapy program for couples in

relationship distress. *Brain Imaging and Behavior, 9*(3), 597–608. https://doi.org/10.1007/s11682-014-9319-7

Dyer, K. F. W., Dorahy, M. J., Corry, M., Black, R., Matheson, L., Coles, H., Curran, D., Seager, L., & Middleton, W. (2017). Comparing shame in clinical and nonclinical populations: Preliminary findings. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*(2), 173–180. https://doi.org/10.1037/tra0000158

Dywan, J., & Segalowitz, S.J. (1996). Self and family ratings of adaptive behavior after traumatic brain injury: psychometric scores and frontally generated ERPs. *Journal of Head Trauma Rehabilitation,11*(2),79-95.

Ecker, B., Hulley, L., & Ticic, R. (2015). Minding the findings: Let's not miss the message of memory reconsolidation research for psychotherapy. *The Behavioral and brain sciences*, *38*, e7. https://doi.org/10.1017/S0140525X14000168

Ecker, B., Bridges, S.K. (2020). How the Science of Memory Reconsolidation Advances the Effectiveness and Unification of Psychotherapy. *Journal of Clinical Social Work,* 48**,** 287–300 https://doi.org/10.1007/s10615-020-00754-z

Edwards E. R., Micek A., Monttarella K., Wupperman . P. (2016). Emotion Ideology Mediates the Effects of Risk Factors on Alexithymia Development. Journal of Rational- Emotional *Cognitive-Behavior Therapy, 35*:254–277. doi 10.1007/s10942-016-0254-y

Edwards, E., Shivaji, S., & Wupperman, P. (2018). The Emotion Mapping Activity: Preliminary evaluation of a mindfulness-informed exercise to improve emotion labeling in alexithymic persons. *Scandinavian journal of psychology*, *59*(3), 319–327. https://doi.org/10.1111/sjop.12438

Eells, T. D., Lombart, K. G., Salsman, N., Kendjelic, E. M., Schneiderman, C. T., & Lucas, C. P. (2011). Expert reasoning in psychotherapy case formulation.

Psychotherapy research: journal of the Society for Psychotherapy Research, *21*(4), 385–399. https://doi.org/10.1080/10503307.2010.539284

Eells, T. D. (2013). The case formulation approach to psychotherapy research revisited. *Pragmatic Case Studies in Psychotherapy, 9*(4), 426–447. https://doi.org/10.14713/pcsp.v9i4.1834

Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology*, *17*(2), 124.

Ekman, P., Sorenson, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. *Science*, *164*(3875), 86-88.

Elliott, R., Watson, J. C., Goldman, R. N., & Greenberg, L. S. (2004). *Learning Emotion-Focused Therapy: The Process-Experiential Approach to Change. Washington*, DC: American Psychological Association.

Elliott, R., Bohart, A. C., Watson, J. C., & Murphy, D. (2018). Therapist empathy and client outcome: An updated meta-analysis. *Psychotherapy (Chicago, Ill.)*, *55*(4), 399–410. https://doi.org/10.1037/pst0000175

Ellis, A., & Bernard, M. E. (Eds.). (1985). *Clinical applications of rational-emotive therapy.* New York: Plenum Press.

Eisenberg, N. (2005). Temperamental effortful control (self-regulation). Encyclopedia on Early Childhood Development. Quebec: Centre of Excellence for Early Childhood Development. Consultado a 11/05/2011 em http://www.child-encyclopedia.com/documents/EisenbergANGxp.pdf.

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An FMRI study of social exclusion. *Science (New York, N.Y.)*, *302*(5643), 290–292. https://doi.org/10.1126/science.1089134

Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual review of clinical psychology*, *6*, 495–525. https://doi.org/10.1146/annurev.clinpsy.121208.131208

Eisenberg, I. W., Bissett, P. G., Zeynep Enkavi, A., Li, J., MacKinnon, D. P., Marsch, L. A., & Poldrack, R. A. (2019). Uncovering the structure of self-regulation through data-driven ontology discovery. *Nature communications*, *10*(1), 2319. https://doi.org/10.1038/s41467-019-10301-1

Epstein, S. (1993). Implications of cognitive-experiential self-theory for personality and developmental psychology. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *APA science Vols. Studying lives through time: Personality and development* (p. 399–438). American Psychological Association. https://doi.org/10.1037/10127-033

Epstein, S. (2003). *Cognitive-experiential self-theory of personality.* In T. Millon & M. J. Lerner (Eds.), *Handbook of psychology: Personality and social psychology, Vol. 5* (p. 159–184). John Wiley & Sons, Inc.. https://doi.org/10.1002/0471264385.wei0507

Erikson, E. H. (1963). *Childhood and Society.* (2nd). New York: W. W. Norton & Co.

Erikson, E. H. & Erikson. J. M. (1997). *The life cycle completed. Extended edition*. New York: W. W. Norton & Co.

Erickson, K. I., Voss, M. W., Prakash, R. S., Basak, C., Szabo, A., Chaddock, L., Kim, J. S., Heo, S., Alves, H., White, S. M., Wojcicki, T. R., Mailey, E., Vieira, V. J., Martin, S. A., Pence, B. D., Woods, J. A., McAuley, E., & Kramer, A. F. (2011). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences of the United States of America*, *108*(7), 3017–3022. https://doi.org/10.1073/pnas.1015950108

Eriksen, B. A., & Eriksen, C. W. (1974). Effects of noise letters upon the identification of a target letter in a nonsearch task. *Perception & Psychophysics, 16*(1), 143–149. https://doi.org/10.3758/BF03203267

Ernst, A., Alkass, K., Bernard, S., Salehpour, M., Perl, S., Tisdale, J., Possnert, G., Druid, H., & Frisén, J. (2014). Neurogenesis in the striatum of the adult human brain. *Cell*, *156*(5), 1072–1083. https://doi.org/10.1016/j.cell.2014.01.044

Ertmer, P. A., & Newby, T. J. (1993). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly, 6*(4), 50–72. https://doi.org/10.1111/j.1937-8327.1993.tb00605.x

Eubanks-Carter, C., Muran, J. C., & Safran, J. D. (2010). *Alliance ruptures and resolution.* In J. C. Muran & J. P. Barber (Eds.), *The therapeutic alliance: An evidence-based guide to practice* (p. 74–94). The Guilford Press.

Etkin, A., Pittenger, C., Polan, J., & Kandel, E. R. (2005). Toward a neurobiology of psychotherapy: basic science and clinical application. *Journal of Neuropsychiatry Clinical Neurosciences*, *17*:145–158.

Esmali Kooraneh, A., & Amirsardari, L. (2015). Predicting Early Maladaptive Schemas Using Baumrind's Parenting Styles. *Iranian journal of psychiatry and behavioral sciences*, *9*(2), e952. https://doi.org/10.17795/ijpbs952

Evans, L. D., Kouros, C. D., Samanez-Larkin, S., & Garber, J. (2016). Concurrent and Short-Term Prospective Relations among Neurocognitive Functioning, Coping, and Depressive Symptoms in Youth. *Journal of clinical child and adolescent psychology: the official journal for the Society of Clinical Child and Adolescent Psychology, American Psychological Association, Division 53*, *45*(1), 6–20. https://doi.org/10.1080/15374416.2014.982282

Ewing, D. L., Monsen, J. J., Thompson, E. J., Cartwright-Hatton, S., & Field, A. (2015). A Meta-Analysis of Transdiagnostic Cognitive Behavioural Therapy in the Treatment of Child and Young Person Anxiety Disorders. *Behavioural and*

cognitive psychotherapy, *43*(5), 562–577. https://doi.org/10.1017/S1352465813001094

Farber, B. A., Suzuki, J. Y., & Lynch, D. A. (2018). Positive regard and psychotherapy outcome: A meta-analytic review. *Psychotherapy, 55*(4), 411–423. https://doi.org/10.1037/pst0000171

Faustino, B., Oliveira, J., & Lopes, P. (2019a). Diagnostic precision of the Wisconsin Card Sorting Test in assessing cognitive deficits in substance use disorders. *Applied Neuropsychology: Adult*, 1–8. doi:10.1080/23279095.2019.1607737

Faustino, B., Vasco, A. B., Oliveira, J., Lopes, P., & Fonseca, I. (2019b). Metacognitive Self-assessment Scale: psychometric properties and clinical applications. *Applied Neuropsychology: Adult*. doi: 10.1080/23279095.2019.1671843

Faustino, B., Fonseca, I., Vasco, A. B., Baião, M., Lopes, P., & Oliveira (2019c). Esquemas Precoces Mal-adaptativos e Dificuldades Emocionais na Regulação das Necessidades Psicológicas: Um estudo com indicadores comportamentais, *Revista de Psicossomática* ISSN –2183-9344, 4. [Early Maladaptive Schemas and Emotional Difficulties on Regulation of Psychological Needs: A study with behavioral indicators]

Faustino, B., Lopes, P., Oliveira, J., Campaioli, G., Rondinone, M., Bomfim, H., & Germano, L. (2019d). Psychometric and rash analysis of the UCLA loneliness scale-16 in a Portuguese sample of older adults. *Psychological Studies, 64*(2), 140. doi:10.1007/s12646-019-00483-5

Faustino, B. (2020). Transdiagnostic Perspective on Psychological Inflexibility and Emotional Dysregulation. *Behavioral and Cognitive Psychotherapy,* 1-14. doi:10.1017/S1352465820000600

Faustino, B. & Vasco, A. B. (2020a). Schematic functioning, interpersonal dysfunctional

cycles, and cognitive fusion in the complementary paradigmatic perspective: analysis of a clinical sample. *Journal of Contemporary Psychotherapy, 1*, 47–55.doi: 10.1007/s10879-019-09422-x

Faustino, B. & Vasco, A. B. (2020b). Early maladaptive schemas and cognitive fusion on the regulation of psychological needs. *Journal of Contemporary Psychotherapy, 1,* 105–112. doi: 10.1007/s10879-019-09446-3

Faustino, B. & Vasco, A. B. (2020c). Relationships between emotional processing difficulties and early maladaptive schemas on the regulation of psychological needs. *Clinical Psychology and Psychotherapy.* doi: 10.1002/cpp.24643

Faustino, B. & Vasco, A. B. (2020d). Factor Structure and Convergent Validity of the Portuguese version of the Inventory of Interpersonal Problems – 32. *Journal of Relationships Research* 1–9. https://doi.org/10.1017/jrr.2020.18

Faustino, B., Oliveira, J & Lopes, P. (2020e). Normative Scores of the Wisconsin Card Sorting Test in a Sample of the Adult Portuguese Population. *Applied Neuropsychology: Adult.* doi: 10.1080/23279095.2020.1810040

Faustino, B., Vasco, A.B., Silva, A.N., & Marques, T. (2020f). Relationships between Emotional Schemas, Mindfulness, Self-Compassion and Unconditional Self-Acceptance on the Regulation of Psychological Needs. *Research in Psychotherapy: Psychopathology, Process and Outcome, 23*(2), 145-156. doi:10.4081/ripppo.2020.442

Faustino, B., (2021). Neurocognition applied to psychotherapy: a brief theoretical proposal based on the complex neural network perspective. *Applied Neuropsychology: Adult.* doi: 10.1080/23279095.2021.1883615

Faustino, B., & Vasco. A B. (2021). Emotional Schemas Mediate the Relationship Between Emotion Regulation and Symptomatology. *Current Psychology*.

Faustino. B., Vasco. A. B., Delgado, J., Farinha-Fernandes, A & Guerreiro. J. (2021a).

Exploring the Impacts of Social Distancing COVID-19 related on Loneliness, Symptomatology and Psychological Needs. *Research in Psychotherapy: Psychopathology, Process and Outcome.*

Faustino, B., Vasco. A. B., Dimaggio, G., Silva. A. N, & Seromenho, S. (2021b). Self-assessment of Subjective Experience: Development and Psychometric Study of the States of Mind Questionnaire. *Research in Psychotherapy: Psychopathology, Process and Outcome,*

Faustino, B. & Vasco, A. B., Silva A. N., & Barreira, J. (in press). Emotional Processing Difficulties Scale-Revisited. *Journal of Person-Centered & Experiential Psychotherapies*

Faustino, B., (in prep). A Transtheoretical and Integrative Approach to the Schema Concept: Introducing the Multidimensional Core Dialectical Schema Theory.

Fehr, B., & Russell, J. A. (1984). Concept of emotion viewed from a prototype perspective. *Journal of Experimental Psychology: General, 113*(3), 464–486. https://doi.org/10.1037/0096-3445.113.3.464

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, *14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Ferreira, J. F., Vasco, A. B., Basseches, M., Santos, A., & Ferreira, J. M. (2017). Analysing phase progression in Susan's case. *Clinical psychology & psychotherapy*, *24*(6), 1343–1354. https://doi.org/10.1002/cpp.2110

Ferreira. L. S. (2020). A Relação entre as Crenças da Personalidade, a Função Reflexiva e as Distorções Cognitivas, e a Regulação das Necessidades Psicológicas, o bem-estar, o distress e a sintomatologia. [The Relationship between Personality Beliefs, Reflective Function and Cognitive Distortions, and the Regulation of

Psychological Needs, Well-Being, Distress and Symptoms.] Master thesis in Faculty of Psychology of University of Lisbon.

Feyerabend, P. K. (1962). Explanation, reduction, and empiricism. University of Minnesota Press, Minneapolis. Retrieved from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/184633.

Flückiger, C., Del Re, A. C., Wampold, B. E., & Horvath, A. O. (2018). The alliance in adult psychotherapy: A meta-analytic synthesis. *Psychotherapy, 55*(4), 316-340. http://dx.doi.org/10.1037/pst0000172

Figueira, M. L., Caeiro, L., Ferro, A., Severino, L., Duarte, P. M., Abreu, M., et al. (2008). Validation of the temperament evaluation of Memphis, Pisa, Paris and San Diego (TEMPS-A): Portuguese-Lisbon version. *Journal of Affective Disorders*, *111*(2), 193-203.doi: 10.1016/j.jad.2008.03.001

Fiske, S. T., & Taylor, S. E. (2017). *Social cognition: From brains to culture* (3/e). London: Sage.

Franke H. A. (2014). Toxic Stress: Effects, Prevention and Treatment. *Children (Basel, Switzerland)*, *1*(3), 390–402. https://doi.org/10.3390/children1030390

Freud, S. (1923). The Ego and the Id. In J. Strachey et al. (Trans.), *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, Volume XIX. London: Hogarth Press.

Friedman, N. P., Miyake, A., Young, S. E., DeFries, J. C., Corley, R. P., & Hewitt, J. K. (2008). Individual differences in executive functions are almost entirely genetic in origin. *Journal of experimental psychology. General*, *137*(2), 201–225. https://doi.org/10.1037/0096-3445.137.2.201

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*(1), 20–35. https://doi.org/10.1037/0033-2909.99.1.20

Fonseca, J. M. (2012). Relação entre a Regulação da Satisfação das Necessidades Psicológicas, Funcionamento Esquemático e Alexitimia. [Relationship between satisfaction of psychological needs, schematic functioning and alexithymia]. Master thesis in the Faculty of Psychology of the University of Lisbon.

Forbes, N. F., Carrick, L. A., McIntosh, A. M., & Lawrie, S. M. (2009). Working memory in schizophrenia: a meta-analysis. *Psychological medicine*, *39*(6), 889–905. https://doi.org/10.1017/S0033291708004558

Fosha, D. (2000). *The transforming power of affect: A model for accelerated change.* Basic Books.

Fountoulakis, K. N., & Gonda, X. (2019). Modeling human temperament and character on the basis of combined theoretical approaches. *Annals of general psychiatry*, *18*, 21. https://doi.org/10.1186/s12991-019-0247-1

Fuchs, T. (2004). Neurobiology and psychotherapy: an emerging dialogue. *Current Opinion in Psychiatry.* No. 17, 479–485

Galandra, C., Basso, G., Manera, M., Crespi, C., Giorgi, I., Vittadini, G., Poggi, P., & Canessa, N. (2018). Salience network structural integrity predicts executive impairment in alcohol use disorders. *Scientific reports*, *8*(1), 14481. https://doi.org/10.1038/s41598-018-32828-x

Garforth, J., McHale, S.L., Meehan, A. (2006). Executive attention, task selection and attention-based learning in a neurally controlled simulated robot. *Neurocomputing 69,*16-18, pp 1923–1945. doi; https://doi.org/10.1016/j.neucom.2005.11.018

Gelso, C. J., Kivlighan, D. M., & Markin, R. D. (2018). The real relationship and its role in psychotherapy outcome: A meta-analysis. *Psychotherapy (Chicago, Ill.)*, *55*(4), 434–444. https://doi.org/10.1037/pst0000183

Gibb. B., Alloy, L., & Abramson. L. (2003) Global reports of childhood maltreatment versus recall of specific maltreatment experiences: Relationships with dysfunctional attitudes and depressive symptoms, *Cognition and Emotion, 17*:6, 903-915, DOI: 10.1080/02699930244000408

Gibb, B. E., Abramson, L.Y. & Alloy, L.B. (2004). Emotional Maltreatment from Parents, Verbal Peer Victimization, and Cognitive Vulnerability to Depression. *Cognitive Therapy and Research 28, 1*–21 https://doi.org/10.1023/B:COTR.0000016927.18027.c2

Gillath, O., Karantzas, G., & Fraley, R. C. (2016). *Adult Attachment: A Concise Guide to Theory and Research.* New York: Academic Press

Gilboa, A., & Marlatte, H. (2017). Neurobiology of Schemas and Schema-Mediated Memory. *Trends in cognitive sciences*, *21*(8), 618–631. https://doi.org/10.1016/j.tics.2017.04.013

Gilbert, P. (2005). *Social Mentalities: A Biopsychosocial and Evolutionary Approach to Social Relationships.* In M. W. Baldwin (Ed.), *Interpersonal cognition* (p. 299–333). Guilford Press.

Gilbert, P. (2010). *Compassion focused therapy: distinctive features. The CBT distinctive features series*. London; New York: Routledge. ISBN 9780415448079. OCLC 463971957.

Gilbert, P., McEwan, K., Matos, M., & Rivis, A. (2011). Fears of compassion: development of three self-report measures. *Psychology and psychotherapy, 84*(3), 239–255. https://doi.org/10.1348/147608310X526511

Gillanders, D. T., Bolderston, H., Bond, F. W., Dempster, M., Flaxman, P. E., Campbell, L., Kerr, S., Tansey, L., Noel, P., Ferenbach, C., Masley, S., Roach, L., Lloyd, J., May, L., Clarke, S., & Remington, R. (2014). The development and initial validation of The Cognitive Fusion Questionnaire. *Behavior Therapy, 45*, 83-101, doi: 10.1016/j.beth.2013.09.001

Grainger, C., Williams, D. M., & Lind, S. E. (2014). Metacognition, metamemory, and mindreading in high-functioning adults with autism spectrum disorder. *Journal of Abnormal Psychology, 123*(3), 650–659. https://doi.org/10.1037/a0036531

Grawe, K. (2004). *Psychological therapy*. Toronto, Cana-da: Hogrefe & Huber.

Grawe, K. (2007). *Neuropsychotherapy. How the Neurosciences inform effective Psychotherapy*. New York: Psychology Press.

Greenberg, L. S. (2015). *Emotion-Focused Therapy: Coaching Clients to Work Through Their Feelings.* 2º ed. American Psychological Association.

Greenberg, L. S., & Paivio, S. C. (1997). *The practicing professional.Working with emotions in psychotherapy*. Guilford Press.

Greenberg, L. S., & Pascual-Leone, J. (2001). A dialectical constructivist view of the creation of personal meaning. *Journal of Constructivist Psychology, 14*(3), 165–186. https://doi.org/10.1080/10720530151143539

Greenberg, L. S., & Pascual-Leone, A. (2006). Emotion in psychotherapy: A practice friendly research review. *Journal of Clinical Psychology, 62,*611–630. doi: 10.1002/jclp.20252

Greenberg, L. S., & Goldman, R. N. (2019). *Clinical handbook of emotion-focused therapy*. Washington, D.C.: American Psychological Association.

Grimm, S., Boesiger, P., Beck, J., Schuepbach, D., Bermpohl, F., Walter, M., Ernst, J., Hell, D., Boeker, H., & Northoff, G. (2009). Altered negative BOLD responses in

the default-mode network during emotion processing in depressed subjects. *Neuropsychopharmacology: official publication of the American College of Neuropsychopharmacology*, *34*(4), 932–943. https://doi.org/10.1038/npp.2008.81

Goldfried, M. R. (1980). Toward the delineation of therapeutic change principles. *American Psychologist, 35*(11), 991–999. https://doi.org/10.1037/0003-066X.35.11.991

Goldfried, M. R. (1982). On the history of therapeutic integration. *Behavior Therapy, 13* 572–593.

Goldfried M. R. (2019). Obtaining consensus in psychotherapy: What holds us back? *The American psychologist*, *74*(4), 484–496. https://doi.org/10.1037/amp0000365

Goldfried, M. R., & Davison, G. C. (1976). *Clinical behavior therapy*. New York: Holt, Rinehart & Winston,

Goldman, R. N., & Greenberg, L. S. (2015). *Case formulation in emotion-focused therapy: Co-creating clinical maps for change*. Washington, D.C.: American Psychological Association.

Gonçalves, O. F., Sampaio, A., Mesquita, A., Petrosyan, A., Pinheiro, A. P., Carvalho, S., Leite, J., Coutinho, J., Osório, A., & Oliveira- Silva, P. (2014). A psicologia como neurociência cognitiva: Implicações para a compreensão dos processos básicos e suas aplicações. *Aná. Psicológica, 32*.1. doi http://dx.doi.org/10.14417/ap.836.

Gonçalves. A. C., (2020). Relação entre modos esquemáticos e metacognição à luz do modelo da complementariedade paradigmática. [Relationship between schematic modes and metacognition in the light of the paradigmatic complementarity model]. Master thesis in Faculty of Psychology of University of Lisbon.

Gonda, X., Eszlári, N., Sutori, S., Aspan, N., Rihmer, Z., Juhasz, G., & Bagdy, G. (2020). Nature and Nurture: Effects of Affective Temperaments on Depressive Symptoms Are Markedly Modified by Stress Exposure. *Frontiers in psychiatry*, *11*, 599. https://doi.org/10.3389/fpsyt.2020.00599

Goldapple, K., Segal, Z., Garson, C., Lau, M., Bieling, P., Kennedy, S., & Mayberg, H. (2004). Modulation of cortical-limbic pathways in major depression: treatment-specific effects of cognitive behavior therapy. *Archives of general psychiatry*, *61*(1), 34–41. https://doi.org/10.1001/archpsyc.61.1.34

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Gross, J. J. (2002). Emotion regulation: affective, cognitive, and social consequences. Psychophysiology, 39, 281–291. doi:10.1017/S0048577201393198

Gross, J. J. (2014). Emotion regulation: empirical foundations. In Handbook of Emotion Regulation, ed. J. Gross, 2nd edn, pp. 3–20. New York, USA: The Guilford Press.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. Journal of Personality and Social Psychology, 85, 348–362. doi: http://dx.doi.org/10.1037/0022-3514.85.2.348

Gottesman, I. I. (1991). *A series of books in psychology. Schizophrenia genesis: The origins of madness.* W H Freeman/Times Books/ Henry Holt & Co.

Guo W, Liu F, Zhang J, Zhang Z, Yu L, et al. (2014) Abnormal Default-Mode Network Homogeneity in First-Episode, Drug-Naive Major Depressive Disorder. *PLOS ONE 9*(3): e91102. https://doi.org/10.1371/journal.pone.0091102

Gunn, W. B., Jr., Haley, J., Prouty, A. M., & Robertson, J. (2015). *Systemic approaches: Family therapy.* In H. T. Prout & A. L. Fedewa (Eds.), *Counseling and psychotherapy with children and adolescents: Theory and practice for school and clinical settings* (p. 317–355). John Wiley & Sons Inc.

Guyer, A. E., Jarcho, J. M., Pérez-Edgar, K., Degnan, K. A., Pine, D. S., Fox, N. A., & Nelson, E. E. (2015). Temperament and Parenting Styles in Early Childhood Differentially Influence Neural Response to Peer Evaluation in Adolescence. *Journal of abnormal child psychology*, *43*(5), 863–874. https://doi.org/10.1007/s10802-015-9973-2

Guy, S. C., Isquith, P. K., & Gioia, G. A. (2004). Behavior Rating Inventory of Executive Function–Self-Report version. Lutz, FL: Psychological Assessment Resources

Hackmann, A. (2011). Imagery rescripting in posttraumatic stress disorder. *Cognitive and Behavioral Practice, 18*(4), 424–432. https://doi.org/10.1016/j.cbpra.2010.06.006

Hallock, H., Collins, D., Lampit, A., Deol, K., Fleming, J., & Valenzuela, M. (2016). Cognitive Training for Post-Acute Traumatic Brain Injury: A Systematic Review and Meta-Analysis. *Frontiers in human neuroscience*, *10*, 537. https://doi.org/10.3389/fnhum.2016.00537

Haines, S. J., Gleeson, J., Kuppens, P., Hollenstein, T., Ciarrochi, J., Labuschagne, I., Grace, C., & Koval, P. (2016). The wisdom to know the difference: Strategy-situation fit in emotion regulation in daily life is associated with well-being. *Psychological Science, 27*(12), 1651–1659. https://doi.org/10.1177/0956797616669086

Harder, S., & Folke, S. (2012). Affect regulation and metacognition in psychotherapy of psychosis: An integrative approach. *Journal of Psychotherapy Integration*, *22*(4), 330-343.

Harvey, A. G., & Gumport, N. B. (2015). Evidence-based psychological treatments for mental disorders: modifiable barriers to access and possible solutions. *Behaviour research and therapy*, *68*, 1–12. https://doi.org/10.1016/j.brat.2015.02.004

Hayden, M. C., Müllauer, P. K., & Andreas. S. (2017). A Systematic Review on the Association between Adult Attachment and Interpersonal *Problems. Journal of Psychology and Psychotherapy 7*: 296. doi: 10.4172/2161-0487.1000296

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: Guilford Press.

Hayes, J. A., Gelso, C. J., Goldberg, S., & Kivlighan, D. M. (2018). Countertransference management and effective psychotherapy: Meta-analytic findings. *Psychotherapy, 55*(4), 496–507. https://doi.org/10.1037/pst0000189

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2011). *Acceptance and Commitment Therapy: The process and practice of mindful change* (2nd Ed.). New York, NY: Guilford Press.

Hawke, L. D., & Provencher, M. D. (2011). Schema Theory and Schema Therapy in Mood and Anxiety Disorders: A Review. *Journal of Cognitive Psychotherapy: An International Quarterly, 25*, (4). Doi: http://dx.doi.org/10.1891/0889-8391.25.4.257

Hawke, L. D., & Provencher, M. D. (2012). Early Maladaptive Schemas among patients diagnosed with bipolar disorder. *Journal of affective disorders*, *136*(3), 803–811. https://doi.org/10.1016/j.jad.2011.09.036

Heaton, R. K., Chelune, G. J., Talley, J. L., Kay, G. G., Curtiss, G. (2005). Wisconsin Card Sorting Test Manual [*Teste Wisconsin de Classificação de Cartas: manual revisado e ampliado*]. Adaptação e padronização brasileira Jurema Alcides Cunha et al. (2005). São Paulo: Casa do Psicólogo.

Henriques-Calado, J. F. (2008). A estrutura da personalidade na esquizofrenia e na demência: uma análise diferencial. (Dissertação de Mestrado). Universidade de Lisboa, Lisboa, Portugal.

Herman-Stahl, M. A., Stemmler, M., & Petersen, A. C. (1995). Approach and avoidant coping: Implications for adolescent mental health. *Journal of Youth and Adolescence, 24*(6), 649–665. https://doi.org/10.1007/BF01536949

Hernandez, L. M. & Blazer, D. G. (2006). Genes, Behavior, and the Social Environment: Moving Beyond the Nature/Nurture Debate. *Washington (DC): National Academies Press (US)*. Available from: https://www.ncbi.nlm.nih.gov/books/NBK19929/ doi: 10.17226/11693

Heshmati, R., & Pellerone, M. (2019). The Big Five personality traits and dispositional mindfulness as predictors of alexithymia in college students. *Clinical Neuropsychiatry: Journal of Treatment Evaluation, 16*(2), 98–106.

Heston, L. L. & Denney, D. (1968). Interactions between early life experience and biological factors in schizophrenia. *Journal of Psychiatric Research,* 6(1). pp. 363-376

Hicks, B. M., Foster, K. T., Iacono, W. G., & McGue, M. (2013). Genetic and environmental influences on the familial transmission of externalizing disorders in adoptive and twin offspring. *JAMA psychiatry*, *70*(10), 1076–1083. https://doi.org/10.1001/jamapsychiatry.2013.258

Hill. C, & Safran. J. (1994). Assessing interpersonal schemas: Anticipated responses of significant others. *Journal of Social and Clinical Psychology, 13:*366-379

Hill, C. E., Knox, S., & Pinto-Coelho, K. G. (2018). Therapist self-disclosure and immediacy: A qualitative meta-analysis. *Psychotherapy (Chicago, Ill.)*, *55*(4), 445–460. https://doi.org/10.1037/pst0000182

Hinshaw S. P. (2018). Attention Deficit Hyperactivity Disorder (ADHD): Controversy, Developmental Mechanisms, and Multiple Levels of Analysis. *Annual review of clinical psychology*, *14*, 291–316. https://doi.org/10.1146/annurev-clinpsy-050817-084917

Holman, D. M., Ports, K. A., Buchanan, N. D., Hawkins, N. A., Merrick, M. T., Metzler, M., & Trivers, K. F. (2016). The Association Between Adverse Childhood Experiences and Risk of Cancer in Adulthood: A Systematic Review of the Literature. *Pediatrics*, *138*(Suppl 1), S81–S91. https://doi.org/10.1542/peds.2015-4268L

Horowitz, M. J. (1989). *States of Mind.* New York: Plenum.

Horowitz, L. M., Rosenberg, S. E., Baer, B. A., Ureño, G., & Villaseñor, V. S. (1988). Inventory of interpersonal problems: Psychometric properties and clinical applications. *Journal of Consulting and Clinical Psychology, 56*(6), 885–892. https://doi.org/10.1037/0022-006X.56.6.885

Hook, J. N., et al. (2019). Religion and spirituality. In *Psychotherapy relationships that work* (3rd ed.) New York: Oxford University Press.

Howells, F. M., Ives-Deliperi, V. L., Horn, N. R., & Stein, D. J. (2012). Mindfulness based cognitive therapy improves frontal control in bipolar disorder: a pilot EEG study. *BMC Psychiatry,* 12:15. doi: 10.1186/1471-244X-12-15.

Hulshoff Pol, H. E., Schnack, H. G., Posthuma, D., Mandl, R. C., Baaré, W. F., van Oel, C., van Haren, N. E., Collins, D. L., Evans, A. C., Amunts, K., Bürgel, U., Zilles, K., de Geus, E., Boomsma, D. I., & Kahn, R. S. (2006). Genetic contributions to human brain morphology and intelligence. *The Journal of neuroscience: the official journal of the Society for Neuroscience*, *26*(40), 10235–10242. https://doi.org/10.1523/JNEUROSCI.1312-06.2006

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences

on health: a systematic review and meta-analysis. *The Lancet. Public health*, *2*(8), e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Humphreys, K. L., LeMoult, J., Wear, J. G., Piersiak, H. A., Lee, A., & Gotlib, I. H. (2020). Child maltreatment and depression: A meta-analysis of studies using the Childhood Trauma Questionnaire. *Child abuse & neglect*, *102*, 104361. https://doi.org/10.1016/j.chiabu.2020.104361

Ingram, R. E., & Kendall, P. C. (1986). *Cognitive clinical psychology: Implications of an information processing perspective.* In R. E. Ingram (Ed.), *Personality, psychopathology, and psychotherapy series. Information processing approaches to clinical psychology* (p. 3–21). Academic Press.

Jaffee, S. R., & Price, T. S. (2012). The implications of genotype-environment correlation for establishing causal processes in psychopathology. *Development and psychopathology*, *24*(4), 1253–1264. https://doi.org/10.1017/S0954579412000685

Janovsky, T., Rock, A. J., Thorsteinsson, E. B., Clark, G. I., & Murray, C. V. (2020). The relationship between early maladaptive schemas and interpersonal problems: A meta-analytic review. *Clinical psychology & psychotherapy*, *27*(3), 408–447. https://doi.org/10.1002/cpp.2439

Javanbakht, A., & Alberini, C. M. (2019). Editorial: Neurobiological Models of Psychotherapy. *Frontiers in behavioral neuroscience*, *13*, 144. https://doi.org/10.3389/fnbeh.2019.00144

Jelinek, L., Jacobsen, D., Kellner, M., Larbig, F., Biesold, K. H., Barre, K., & Moritz, S. (2006). Verbal and nonverbal memory functioning in posttraumatic stress disorder (PTSD). *Journal of clinical and experimental neuropsychology*, *28*(6), 940–948. https://doi.org/10.1080/13803390591004347

Kaczkurkin, A. N., & Foa, E. B. (2015). Cognitive-behavioral therapy for anxiety disorders: an update on the empirical evidence. *Dialogues in clinical*

neuroscience, *17*(3), 337–346.
https://doi.org/10.31887/DCNS.2015.17.3/akaczkurkin

Kandel, E. R. (1998). A new intellectual framework for psychiatry. The American Journal of Psychiatry, 155(4), 457–469. http://doi.org/10.1176/ajp.155.4.457

Kandel, E. R., Schwartz, J. H., & Jessell, T. M. (Eds.) (2013). *Principles of neural science* (5th ed.). New York: McGraw-Hill.

Kappenman, E. S., & Luck, S. J. (2012). *ERP components: The ups and downs of brainwave recordings.* In S. J. Luck & E. S. Kappenman (Eds.), *Oxford library of psychology. The Oxford handbook of event-related potential components* (p. 3–30). Oxford University Press.

Karter, J. M., & Kamens, S. R. (2019). Toward conceptual competence in psychiatric diagnosis: An ecological model for critiques of the DSM. In S. Steingard (Ed.), *Critical psychiatry* (pp. 17-69). Basel, Switzerland: Springer.

Karatzias, T., Jowett, S., Begley, A., & Deas, S. (2016). Early maladaptive schemas in adult survivors of interpersonal trauma: foundations for a cognitive theory of psychopathology. *European journal of psychotraumatology*, *7*, 30713. https://doi.org/10.3402/ejpt.v7.30713

Karreman, A., van Tuijl, C., van Aken, M. A. G., & Dekovic, M. (2006). Parenting and Self-Regulation in Preschoolers: A Meta-Analysis. *Infant and Child Development, 15*(6), 561–579. https://doi.org/10.1002/icd.478

Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review, 30*, 865–878. doi: 10.1016/j.cpr.2010.03.001

Kavanaugh, B. C., Dupont-Frechette, J. A., Jerskey, B. A., & Holler, K. A. (2017). Neurocognitive deficits in children and adolescents following maltreatment: Neurodevelopmental consequences and neuropsychological implications of

traumatic stress. *Applied neuropsychology. Child*, *6*(1), 64–78. https://doi.org/10.1080/21622965.2015.1079712

Kaya Tezel, F., Tutarel Kişlak, Ş., & Boysan, M. (2015). Relationships between Childhood Traumatic Experiences, Early Maladaptive Schemas and Interpersonal Styles. *Noro psikiyatri arsivi*, *52*(3), 226–232. https://doi.org/10.5152/npa.2015.7118

Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3,* 1–27.

Kazdin, A. E. (2008). Evidence-based treatment and practice: New opportunities to bridge clinical research and practice, enhance the knowledge base, and improve patient care. *American Psychologist, 63*(3), 146–159. https://doi.org/10.1037/0003-066X.63.3.146

Kazdin, A. E. (2009). Understanding how and why psychotherapy leads to change. *Psychotherapy Research, 19*(4–5), 418–428.

Kealy, D., Ogrodniczuk, J. S., & Howell-Jones, G. (2011). Object relations and emotional processing deficits among psychiatric outpatients. *The Journal of nervous and mental disease*, *199*(2), 132–135. https://doi.org/10.1097/NMD.0b013e3182083162

Kendler, K. S., & Prescott, C. A. (1999). A population-based twin study of lifetime major depression in men and women. *Archives of general psychiatry*, *56*(1), 39–44. https://doi.org/10.1001/archpsyc.56.1.39

Kelleher, I., Keeley, H., Corcoran, P., Ramsay, H., Wasserman, C., Carli, V., Sarchiapone, M., Hoven, C., Wasserman, D., & Cannon, M. (2013). Childhood trauma and psychosis in a prospective cohort study: cause, effect, and directionality. *The American journal of psychiatry*, *170*(7), 734–741. https://doi.org/10.1176/appi.ajp.2012.12091169

Kennedy, B. L., Schwab, J. J., & Hyde, J. A. (2001). Defense styles and Personality dimensions of research subjects with anxiety and depressive disorders. *The Psychiatric quarterly*, *72*(3), 251–262. https://doi.org/10.1023/a:1010353116016

Kennedy, S. H., Konarski, J. Z., Segal, Z. V., Lau, M. A., Bieling, P. J., McIntyre, R. S., & Mayberg, H. S. (2007). Differences in brain glucose metabolism between responders to CBT and venlafaxine in a 16-week randomized controlled trial. *The American journal of psychiatry*, *164*(5), 778–788. https://doi.org/10.1176/ajp.2007.164.5.778

Kelly, G. A. (1955). *The psychology of personal constructs. Vol. 1. A theory of personality. Vol. 2. Clinical diagnosis and psychotherapy.* W. W. Norton.

Kenny, D. A. (2017). MedPower: *An interactive tool for the estimation of power in tests of mediation* [Computer software]. Available from https://davidakenny.shinyapps.io/Med-Power/.

Khosravi M. (2020). Child maltreatment-related dissociation and its core mediation schemas in patients with borderline personality disorder. *BMC psychiatry*, *20*(1), 405. https://doi.org/10.1186/s12888-020-02797-5

Khosravani, V., Sharifi Bastan, F., Samimi Ardestani, M., & Jamaati Ardakani, R. (2017). Early maladaptive schemas and suicidal risk in an Iranian sample of patients with obsessive-compulsive disorder. *Psychiatry research*, *255*, 441–448. https://doi.org/10.1016/j.psychres.2017.06.080

Killgore, W. D., & Yurgelun-Todd, D. A. (2004). Activation of the amygdala and anterior cingulate during nonconscious processing of sad versus happy faces. *Neuroimage*, *21*(4), 1215-1223.

Kirchner, T., Forns, M., Amador, J. A., & Muñoz, D. (2010). Stability and consistency of coping in adolescence: A longitudinal study. *Psicothema*, *22*(3), 382–388

Knopik, V. S., Neiderhiser, J. M., DeFries, J. C., & Plomin, R. (2017). *Behavioral genetics*. New York, NY: Macmillan Higher Education

Kobylińska, D., & Kusev, P. (2019). Flexible emotion regulation: How situational demands and individual differences influence the effectiveness of regulatory strategies. *Frontiers in Psychology, 10,* Article 72. https://doi.org/10.3389/fpsyg.2019.00072

Kolden, G. G., Wang, C. C., Austin, S. B., Chang, Y., & Klein, M. H. (2018). Congruence/genuineness: A meta-analysis. *Psychotherapy (Chicago, Ill.)*, *55*(4), 424–433. https://doi.org/10.1037/pst0000162

Konarski, J. Z., Kennedy, S. H., Segal, Z. V., Lau, M. A., Bieling, P. J., McIntyre, R. S., et al. (2009). Predictors of nonresponse to cognitive behavioural therapy or venlafaxine using glucose metabolism in major depressive disorder. *Journal of Psychiatry and Neuroscience*. 34, 175.

Kong, F., Wang, X., & Zhao, J. J. (2014). Dispositional mindfulness and life satisfaction: the role of core self-evaluations. *Personality and Individual Differences, 56*, 165–169. https://doi.org/10.1016/j.paid.2013.09.002.

Körner, A., Drapeau, M., Perry, J. C., Kurth, R. A., Pokorny, D., & Geyer, M. (2004). Self-assessment of interpersonal schemas using the Relationship Patterns Questionnaire: A quantitative approach. *Psychotherapy Research, 14*, 435–452. https ://doi.org/10.1093/ptr/kph03 6.

Krafft, J., Haeger, J. A., & Levin, M. E. (2019). Comparing cognitive fusion and cognitive reappraisal as predictors of college student mental health. *Cognitive Behaviour Therapy, 48*(3), 241–252. https://doi.org/10.1080/16506073.2018.1513556.

Krause, E. D., Mendelson, T., & Lynch, T. R. (2003). Childhood emotional invalidation and adult psychological distress: The mediating role of emotional inhibition.

Child Abuse & Neglect, 27(2), 199–213. https://doi.org/10.1016/S0145-2134(02)00536-7

Krebs, P., Norcross, J. C., Nicholson, J. M., & Prochaska, J. O. (2018). Stages of change and psychotherapy outcomes: A review and meta-analysis. *Journal of clinical psychology*, *74*(11), 1964–1979. https://doi.org/10.1002/jclp.22683

Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd ed.). University of Chicago Press. https://doi.org/10.7208/chicago/9780226458106.001.0001

Kurth, R. A., & Pokorny, D. (1999). *Der Beziehungs-Muster Fragebogen—BeMus* [The Relationship Patterns Questionnaire—RPQ]. Unpublished manuscript, Justus-Liebig-Universität Giessen.

Lambert, M. J., & Barley, D. E. (2002). *Research summary on the therapeutic relationship and psychotherapy outcome.* In J. C. Norcross (Ed.), *Psychotherapy relationships that work: Therapist contributions and responsiveness to patients* (p. 17–32). Oxford University Press.

Lambert, M. J., et al. (2019). Collecting and delivering client feedback. In *Psychotherapy relationships that work* (3rd ed.)..New York: Oxford University.

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1995-2008). *International Affective Picture System (IAPS): Technical manual and affective ratings.* Gainesville: University of Florida. Center for Research in Psychophysiology.

Lane, R. D., & Nadel, L. (2020). *Neuroscience of enduring change. Implications for psychotherapy*. New York: Oxford University Press.

LeCuyer, E. A., & Swanson, D. P. (2017). A within-group analysis of African American mothers' authoritarian attitudes, limit-setting and children's self-regulation. *Journal of Child and Family Studies, 26*(3), 833–842. https://doi.org/10.1007/s10826-016-0609-0

LeDoux J. (1998). Fear and the brain: where have we been, and where are we going?. *Biological psychiatry*, *44*(12), 1229–1238. https://doi.org/10.1016/s0006-3223(98)00282-0

LeDoux J. (2007). The amygdala. *Current biology: CB*, *17*(20), R868–R874. https://doi.org/10.1016/j.cub.2007.08.005

LeDoux, J. E. (1994). Emotion, memory and the brain. *Scientific American, 270*, 50-57.

LeDoux, J.E. (2000). Emotion Circuits in the Brain. *Annual Review of Neuroscience, 23*, 155-184.

LeDoux, J. (2012). Rethinking the emotional brain. *Neuron, 73*(4), 653-676.

Leahy, R. L. (2007). Emotion and psychotherapy. *Clinical Psychology: Science and Practice, 14*(4), 353–357. https://doi.org/10.1111/j.1468-2850.2007.00095.x

Leahy, R. L. (2012). Introduction: Emotional schemas, emotion regulation, and psychopathology. *International Journal of Cognitive Therapy, 5*(4), 359-361.

Leahy, R. L. (2015). *Emotional schema therapy*. New York, NY: Guilford Press.

Lezak, M. D, Howieson, D. B, & Bigle, E. D, & Tranel. D. (2014) Neuropsychological assessment, (5th ed). Oxford University Press, New York

Lehto, S., Tolmunen, T., Joensuu, M., Saarinen, P. I., Vanninen, R., Ahola, P., Tiihonen, J., Kuikka, J., Lehtonen, J. (2006). Midbrain binding of [123I]nor-beta-CIT in atypical depression. *Progress in Neuropsychopharmacology and Biological Psychiatry, 30*:1251–1255.

Leutgeb, V., Schäfer, A., & Schienle, A. (2009). An event-related potential study on exposure therapy for patients suffering from spider phobia. Biological Psychology, 82(3), 293-300. Doi: http://dx.doi.org/10.1016/j.biopsycho.2009.09.003.

Levin, M. E., MacLane, C., Daflos, S., Seeley, J., Hayes, S. C., Biglan, A., & Pistorello, J. (2014). Examining psychological inflexibility as a transdiagnostic process across psychological disorders. *Journal of contextual behavioral science*, *3*(3), 155–163. https://doi.org/10.1016/j.jcbs.2014.06.003

Levy, K. N., Kivity, Y., Johnson, B. N., & Gooch, C. V. (2018). Adult attachment as a predictor and moderator of psychotherapy outcome: A meta-analysis. *Journal of clinical psychology*, *74*(11), 1996–2013. https://doi.org/10.1002/jclp.22685

Lewis, M. D. (2000). Emotional Self-Organization at Three Time Scales. In M. Lewis & I. Granic (Eds.), *Emotion, Development, and Self-Organization: Dynamic Systems Approaches to Emotional Development* (pp. 37-69). Cambridge, MA: Cambridge University Press.

Linehan, M. M. (1993). Cognitive-Behavioral Treatment of Borderline Personality Disorders. New York: The Guilford Press.

Liotti, G. (2004). The inner schema of borderline states and its correction during psychotherapy: A cognitive-evolutionary approach. In P. Gilbert (Ed.), *Evolutionary theory and cognitive psychotherapy* (pp. 137–160). New York: Springer.

Liotti, G., & Intreccialagli, B. (2003). *Disorganized attachment, motivational systems and metacognitive monitoring in the treatment of a patient with borderline syndrome.* In M. Cortina & M. Marrone (Eds.), *Attachment theory and the psychoanalytic process* (p. 356–381). Whurr Publishers.

Liotti, G., & Gilbert, P. (2011). Mentalizing, motivation, and social mentalities: theoretical considerations and implications for psychotherapy. *Psychology and psychotherapy*, *84*(1), 9–110. https://doi.org/10.1348/147608310X520094

Li, J.-B., Willems, Y. E., Stok, F. M., Deković, M., Bartels, M., & Finkenauer, C. (2019). Parenting and Self-Control Across Early to Late Adolescence: A Three-

Level Meta-Analysis. Perspectives on Psychological Science, 14(6), 967–1005. https://doi.org/10.1177/1745691619863046

Li, W., Mai, X., & Liu, C. (2014). The default mode network and social understanding of others: what do brain connectivity studies tell us. frontiers in Human Neuroscience, 8. doi: 10.3389/fnhum.2014.00074

Liddell, B. J., Brown, K. J., Kemp, A. H., Barton, M. J., Das, P., Peduto, et al. (2005). A direct brainstem-amygdala-cortical 'alarm' system for subliminal signals of fear. *Neuroimage*, *24*(1), 235-243.

Lobbestael, J., van Vreeswijk, M., & Arntz, A. (2008). An empirical test of schema mode conceptualizations in personality disorders. *Behaviour Research and Therapy*, 46, 854–860. https://doi:10.1016/j.brat.2008.03.006.

Lobbestael, J., van Vreeswijk, M., Spinhoven, P., Schouten, E., & Arntz, A. (2010). Reliability and validity of the short Schema Mode Inventory (SMI). *Behavioural and cognitive psychotherapy*, *38*(4), 437–458. https://doi.org/10.1017/S1352465810000226

Lockwood, G., & Perris, O. (2012). A new look at core emotional needs. In M. V. Vreeswijk, J. Broersen & M. Nadort (Ed.), *The Wiley-Blackwell Handbook of Schema Therapy: Theory, Research, and Practice* (pp. 41-66). John Wiley & Sons, Ltd. Doi: https://doi.org/10.1002/9781119962830.ch3

Long, N. M., Kuhl, B. A., & Chun, M. M. (2018). *Memory and Attention*. In Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience, Learning and Memory (Vol. 1, p. 285). John Wiley & Sons.

Lucangeli, D., Cornoldi, C., & Tellarini, M. (1998). *Metacognition and learning disabilities in mathematics.* In T. E. Scruggs & M. A. Mastropieri (Eds.), *Advances in learning and behavioral disabilities, Vol. 12* (p. 219–244). Elsevier Science/JAI Press.

Lumley, M. A., Neely, L. C., & Burger, A. J. (2007). The assessment of alexithymia in medical settings: implications for understanding and treating health problems. *Journal of personality assessment*, *89*(3), 230–246. https://doi.org/10.1080/00223890701629698

Luminet, O., & Zamariola, G. (2018). *Emotion knowledge and emotion regulation in alexithymia.* In O. Luminet, R. M. Bagby, & G. J. Taylor (Eds.), *Alexithymia: Advances in research, theory, and clinical practice* (p. 49–77). Cambridge University Press. https://doi.org/10.1017/9781108241595.006

Luria, A.R. (1966). *Higher cortical functions in man.* Basic Books.

Lysaker, P. H., Warman, D. M., Dimaggio, G., Procacci, M., LaRocco, V. A., & Clark, L. K. (2008). Metacognition in schizophrenia associations with multiple assessments of executive functions. *The Journal of Nervous and Mental Disease, 196*(5), 384–389. doi:10.1097/NMD.0b013e3181710916

Lyssenko, L., Schmahl, C., Bockhacker, L., Vonderlin, R., Bohus, M., & Kleindienst, N. (2018). Dissociation in Psychiatric Disorders: A Meta-Analysis of Studies Using the Dissociative Experiences Scale. The American journal of psychiatry, 175(1), 37–46. https://doi.org/10.1176/appi.ajp.2017.17010025

MacAulay, R., & Cohen, A. S. (2013). Affecting coping: does neurocognition predict approach and avoidant coping strategies within schizophrenia spectrum disorders?. *Psychiatry research*, *209*(2), 136–141. https://doi.org/10.1016/j.psychres.2013.04.004

MacBeth, A., & Gumley, A. (2012). Exploring compassion: a meta-analysis of the association between self-compassion and psychopathology. *Clinical psychology review*, *32*(6), 545–552. https://doi.org/10.1016/j.cpr.2012.06.003

Madeline, N. (2017). The Relationship Between Parenting Style and Self-Regulation in Early Childhood. Honors Theses and Capstone Projects. 14.https://scholar.dominican.edu/honors-theses/1

Mak, L. E., Minuzzi, L., MacQueen, G., Hall, G., Kennedy, S. H., & Milev, R. (2017). The Default Mode Network in Healthy Individuals: A Systematic Review and Meta-Analysis. *Brain connectivity*, *7*(1), 25–33. https://doi.org/10.1089/brain.2016.0438

Magnavita, J. J. (1997). *Restructuring personality disorders: A short-term dynamic approach.* Guilford Press.

Magnavita, J. J. (2004). *Classification, Prevalence, and Etiology of Personality Disorders: Related Issues and Controversy.* In J. J. Magnavita (Ed.), *Handbook of Personality Disorders: Theory and Practice* (p. 3–23). John Wiley & Sons Inc.

Magnavita, J. J. (Ed.). (2010). *Evidence-based treatment of personality dysfunction: Principles, methods, and processes.* American Psychological Association. https://doi.org/10.1037/12130-000

Malaspina D. (2001). Paternal factors and schizophrenia risk: de novo mutations and imprinting. *Schizophrenia bulletin*, *27*(3), 379–393. https://doi.org/10.1093/oxfordjournals.schbul.a006882

Martino, D. J., Igoa, A., Marengo, E., Scápola, M., & Strejilevich, S. A. (2011). Neurocognitive impairments and their relationship with psychosocial functioning in euthymic bipolar II disorder. *The Journal of nervous and mental disease*, *199*(7), 459–464. https://doi.org/10.1097/NMD.0b013e3182214190

Marvel, C. L., & Paradiso, S. (2004). Cognitive and neurological impairment in mood disorders. *The Psychiatric clinics of North America*, *27*(1), 19–viii. https://doi.org/10.1016/S0193-953X(03)00106-0

Maslow, A. H. (1954). *Motivation and personality.* Harpers.

Mason, L., Peters, E., Williams, S. C., & Kumari, V. (2017). Brain connectivity changes occurring following cognitive behavioral therapy for psychosis predict long-term recovery. *Translational Psychiatry, 7.*

Marrón, M. E., Alisente, J. L., Izaguirre, N. G., Lubrini, B. G., Morales, J. A., Lago, M. R., Cubillo, I. S., Ustárroz, J. T., & Cardoso, A. Z. (2014). *Estimulación Cognitiva y Rehabilitación Neuropsicológica*. Barcelona: Editorial UOC.

Marshall, E. J., & Brockman, R. N. (2016). The Relationships Between Psychological Flexibility, Self-Compassion, and Emotional Well-Being. *Journal of cognitive psychotherapy*, *30*(1), 60–72. https://doi.org/10.1891/0889-8391.30.1.60

Martins, R. (2016). *Relações entre esquemas interpessoais, mecanismos de defesa, necessidades psicológicas, sintomatologia, bem-estar e distress psicológico.* [Relations between interpersonal schemes, mechanisms of defense, psychological needs, symptomatology, well-being and psychological distress]. Master thesis in Faculty of Psychology of University of Lisbon.

Matthews, G. & Harley, T. A. (1996). Connectionist models of emotional distress and attentional bias. *Cognition and Emotion, 10,* 561– 6

Mavranezouli I., et al., (2020). Psychological treatments for post-traumatic stress disorder in adults: a network meta-analysis. *Psychological Medicine,* 1–14. https://doi.org/10.1017/S0033291720000070

Mavranezouli, I., Megnin-Viggars, O., Daly, C., Dias, S., Welton, N. J., Stockton, S., Bhutani, G., Grey, N., Leach, J., Greenberg, N., Katona, C., El-Leithy, S., & Pilling, S. (2020). Psychological treatments for post-traumatic stress disorder in adults: a network meta-analysis. *Psychological medicine*, *50*(4), 542–555. https://doi.org/10.1017/S0033291720000070

McLeod, B. D., Weisz, J. R., & Wood, J. J. (2007). Examining the association between parenting and childhood depression: a meta-analysis. *Clinical psychology review*, *27*(8), 986–1003. https://doi.org/10.1016/j.cpr.2007.03.001

McLeod, B. D., Wood, J. J., & Weisz, J. R. (2007). Examining the association between parenting and childhood anxiety: a meta-analysis. *Clinical psychology review*, *27*(2), 155–172. https://doi.org/10.1016/j.cpr.2006.09.002

Menon, V., & Uddin, L. Q. (2010). Saliency, switching, attention and control: a network model of insula function. *Brain structure & function*, *214*(5-6), 655–667. https://doi.org/10.1007/s00429-010-0262-0

Menon V. (2011). Large-scale brain networks and psychopathology: a unifying triple network model. *Trends in cognitive sciences*, *15*(10), 483–506. https://doi.org/10.1016/j.tics.2011.08.003

Messina, U., Sambin, M., Beschoner, P., & Viviani, R. (2016). Changing views of emotion regulation and neurobiological models of the mechanism of action of psychotherapy. *Cognitive Affective Behavior Neuroscience, 16*, (4):571-87. doi: 10.3758/s13415-016-0440-5

Miceli, M., & Castelfranchi, C. (2001). Further distinctions between coping and defense mechanisms?. *Journal of personality*, *69*(2), 287–296. https://doi.org/10.1111/1467-6494.00146

Millon, T. (1990). *The disorders of personality.* In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (p. 339–370). The Guilford Press.

Miller, B. L., & Cummings, J. L. (Eds.). (2007). *The human frontal lobes: Functions and disorders* (2nd ed.). The Guilford Press.

Miskovic, V. Moscovitch, D. A., Santesso, D. L., McCabe, R. E., Antony, M. M., & Schmidt, L. A (2011). Changes in EEG cross-frequency coupling during cognitive behavioral therapy for social anxiety disorder. *Psychological Science*, 22(4):507-16. doi: 10.1177/0956797611400914

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions

to complex "frontal lobe" tasks: A latent variable analysis. Cognitive Psychology, 41, 49-100. doi:10.1006/cogp.1999.0734

Moldin, S. O., & Gottesman, I. I. (1997). Genes, experience, and chance in schizophrenia—Positioning for the 21st century. *Schizophrenia Bulletin, 23*(4), 547–561. https://doi.org/10.1093/schbul/23.4.547

Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin, 128*(4), 638–662. https://doi.org/10.1037/0033-2909.128.4.638

Moreira, H., Gouveia, M. J., Carona,C., Silva, N., & Canavarro, M. C. (2015). Maternal attachment and children's quality of life: The mediating role of self-compassion and parenting stress. *Journal of Child and Family Studies, 24*(8), 2332-2344. doi:10.1007/s10826-014-0036-z

Morris, L., & Mansell, W. (2018). A systematic review of the relationship between rigidity/flexibility and transdiagnostic cognitive and behavioral processes that maintain psychopathology. *Journal of Experimental Psychopathology.* https://doi.org/10.1177/2043808718779431

Moshman, D. (1982). Exogenous, endogenous, and dialectical constructivism. Developmental Review, 2(4), 371–384. https://doi.org/10.1016/0273-2297(82)90019-3

Moscovitch, D. A., Santesso, D. L., Miskovic, V., McCabe, R. E., Antony, M. M., & Schmidt, L. A (2011). Frontal EEG asymmetry and symptom response to cognitive behavioral therapy in patients with social anxiety disorder. Biopsychology, 87, (3):379-85. doi: 10.1016/j.

Mosquera. D & Steele. K. (2017). Complex trauma, dissociation and Borderline Personality Disorder: Working with integration failures. *European Journal of Trauma & Dissociation, 1*(1), pp 63-71. https://doi.org/10.1016/j.ejtd.2017.01.010

Moura, O., Simões, M. R. e Pereira, M. (2013). Fluência verbal semântica e fonêmica em crianças: Funções cognitivas e análise temporal. Avaliação Psicológica, 12(2), 167-177.

Moos, R. H., Holahan, C. J., & Beutler, L. E. (2003). Dispositional and Contextual Perspectives on Coping: Introduction to the Special Issue. *Journal of Clinical Psychology, 59*(12), 1257–1259. https://doi.org/10.1002/jclp.10218

Mulder G. (1983). The information processing paradigm: concepts, methods and limitations. *Journal of child psychology and psychiatry, and allied disciplines*, *24*(1), 19–36. https://doi.org/10.1111/j.1469-7610.1983.tb00100.x

Murdock, K. W., Oddi, K. B., & Bridgett, D. J. (2013). Cognitive correlates of personality: Links between executive functioning and the big five personality traits. *Journal of Individual Differences, 34*(2), 97–104. https://doi.org/10.1027/1614-0001/a000104

Murray, H.A. (1938). *Explorations in personality.* Oxford Univ. Press.

Neff, K. D. (2003). Self-compassion: an alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2,* 85–102

Neff, K. D., Hseih, Y., & Dejitthirat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity, 4*, 263–287

Neisser, U. (1967). *Cognitive psychology.* Appleton-Century-Crofts.

Nelson, M. D., Saykin, A. J., Flashman, L. A., & Riordan, H. J. (1998). Hippocampal Vol. reduction in schizophrenia as assessed by magnetic resonance imaging: A meta-analytic study. *Archives of General Psychiatry, 55*(5), 433–440. https://doi.org/10.1001/archpsyc.55.5.433

Newby, J. M., McKinnon, A., Kuyken, W., Gilbody, S., & Dalgleish, T. (2015). Systematic review and meta-analysis of transdiagnostic psychological treatments

for anxiety and depressive disorders in adulthood. *Clinical psychology review*, *40*, 91–110. https://doi.org/10.1016/j.cpr.2015.06.002

Newman. (2017). The Relationship Between Parenting Style and Self-Regulation in Early Childhood. *Honors Theses*. 14. https://doi.org/10.33015/dominican.edu/2017.HONORS.ST.19. University of California.

Nicolò, G., Dimaggio, G., Popolo, R., Carcione, A., Procacci, M., Hamm, J., … Lysaker, P. H. (2012). Associations of metacognition with symptoms, insight, and neurocognition in clinically stable outpatients with schizophrenia. *Journal of Nervous Mental Disease, 200*, 644–647. doi:10.1097/NMD.0b013e31825bfb10

Nijdam, M. J., Martens, I., Reitsma, J. B., Gersons, B., & Olff, M. (2018). Neurocognitive functioning over the course of trauma-focused psychotherapy for PTSD: Changes in verbal memory and executive functioning. *The British journal of clinical psychology*, *57*(4), 436–452. https://doi.org/10.1111/bjc.12183

Norcross, J. C. & Goldfried, M. R. (2019). *Handbook of psychotherapy integration*. Oxford, UK: Oxford University Press. https://dx.doi.org/10.1093/med-psych/9780190690465.001.0001

Norcross, J. C., & Alexander, E. F. (2019). A primer on psychotherapy integration. In J. C. Norcross & M. R. Goldfried (Eds.), *Handbook of psychotherapy integration*. Oxford University Press.

Norcross, J. C. & Lambert, M. J. (Eds.). (2019). *Psychotherapy relationships that work: Volume 1: Evidence-based therapist contributions*. New York: Oxford University Press. http://dx.doi.org/10.1093/med-psych/9780190843953.001.0001

Norcross, J. C., & Wampold, B. E. (2018). A new therapy for each patient: Evidence-based relationships and responsiveness. *Journal of clinical psychology*, *74*(11), 1889–1906. https://doi.org/10.1002/jclp.22678

Norcross, J. C. & Wampold, B. E. (Eds.). (2019*). Psychotherapy Relationships that Work: Volume 2: Evidence-Based Therapist Responsiveness*. New York: Oxford University Press. http://dx.doi.org/10.1093/med-psych/9780190843960.001.0001

Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behaviour. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Es.), *Consciousness and Self-Regulation: Advances in Research and Theory* (vol. 4) New York:P lenum Press.

Nyhus, E., & Barceló, F. (2009). The Wisconsin Card Sorting Test and the cognitive assessment of prefrontal executive functions: a critical update. *Brain and cognition*, *71*(3), 437–451. https://doi.org/10.1016/j.bandc.2009.03.005

Ochsner, K.N. & Gross, J.J. (2007). The Neural Architecture of Emotion Regulation. In: J. Gross (Ed.), *Handbook of Emotion Regulation*, (pp. 87-109). New York, NY: Guilford Press.

Olofsson, J. K., & Polich, J. (2007). Affective visual event-related potentials: arousal, repetition, and time-on-task. *Biological Psychology*, *75*(1), 101-108.

Olofsson, J. K., Nordin, S., Sequeira, H., & Polich, J. (2008). Affective picture processing: An integrative review of ERP findings. *Biological Psychology*, *77*(3), 247-265.

Oostenveld, R., Fries, P., Maris, E., & Schoffelen, J. M. (2011). FieldTrip: Open Source Software for Advanced Analysis of MEG, EEG, and Invasive Electrophysiological Data. *Computational Intelligence and Neuroscience, 2011* (1), doi: 10.1155/2011/156869.

Paap, K. R., Anders-Jefferson, R., Zimiga, B., Mason, L., & Mikulinsky, R. (2020). Interference scores have inadequate concurrent and convergent validity: Should we stop using the flanker, Simon, and spatial Stroop tasks?. *Cognitive research: principles and implications*, *5*(1), 7. https://doi.org/10.1186/s41235-020-0207-y

Pallant, J. (2007). *SPSS Survival Manual: A Step-by-Step Guide to Data Analysis Using SPSS for Windows* (Version 15). Open University Press. McGrow Hill Education.

Pallini, S., Chirumbolo, A., Morelli, M., Baiocco, R., Laghi, F., & Eisenberg, N. (2018). The relation of attachment security sta-tus to effortful self-regulation: A meta-analysis. *Psychological Bulletin, 144*, 501–531. doi:10.1037/bul0000134

Palmeira, Lara; Pinto-Gouveia, José; Dinis, A.; Lourenço, S. (2011). O papel dos esquemas emocionais na transgeracionalidade do processo de socialização das emoções negativas, *Psychologica* 52, 4: 435 - 460.

Pagani, M., Di Lorenzo, G., Verardo, A. R., Nicolais, G., Monaco, L., Lauretti, G., Russo, R., Niolu, C., Ammaniti, M., Fernandez, I., & Siracusano, A. (2012). Neurobiological correlates of EMDR monitoring - an EEG study. *PloS one*, 7(9), e45753. https://doi.org/10.1371/journal.pone.0045753

Panksepp, J. (1998). *Affective Neuroscience: The Foundations of Human and Animal Emotions*. New York, NY: Oxford University Press.

Panksepp, J. (2005). Affective consciousness: Core emotional feelings in animals and humans. Consciousness and Cognition, 14(1), 30-80.

Panksepp, J. (2011). The basic emotional circuits of mammalian brains: do animals have affective lives? Neuroscience & Biobehavioral Reviews, 35(9), 1791-1804.

Panizzon, M. S., Vuoksimaa, E., Spoon, K. M., Jacobson, K. C., Lyons, M. J., Franz, C. E., Xian, H., Vasilopoulos, T., & Kremen, W. S. (2014). Genetic and Environmental Influences of General Cognitive Ability: Is *g* a valid latent construct?. *Intelligence*, *43*, 65–76. https://doi.org/10.1016/j.intell.2014.01.008

Park, N. W., & Ingles, J. L. (2001). Effectiveness of attention rehabilitation after an acquired brain injury: a meta-analysis. *Neuropsychology*, *15*(2), 199–210. https://doi.org/10.1037//0894-4105.15.2.199

Pascual-Leone, A., & Greenberg, L. S. (2007). Emotional processing in experiential therapy: Why "the only way out is through." *Journal of Consulting and Clinical Psychology, 75*(6), 875–887. https://doi.org/10.1037/0022-006X.75.6.875

Pavlov, I. P. (1927). *Conditioned reflexes: an investigation of the physiological activity of the cerebral cortex.* Oxford Univ. Press.

Pearce, J., Murray, C., & Larkin, W. (2019). Childhood adversity and trauma: experiences of professionals trained to routinely enquire about childhood adversity. *Heliyon*, *5*(7), e01900. https://doi.org/10.1016/j.heliyon.2019.e01900

Pedone, R., Semerari, A., Riccardi, I., Procacci, M., Nicolò, G., & Carcione, A. (2017). Development of a self-report measure of metacognition: The Metacognition Self-Assessment Scale (MSAS). Instrument description and factor structure. *Clinical Neuropsychiatry: Journal of Treatment Evaluation, 14*(3), 185–194.

Peluso, P. R., & Freund, R. R. (2018). Therapist and client emotional expression and psychotherapy outcomes: A meta-analysis. *Psychotherapy, 55*(4), 461–472. https://doi.org/10.1037/pst0000165

Pepper, S. C. (1942). World hypotheses: A study in evidence. University of California Press: USA.

Perez-Gramaje, A. F., Garcia, O. F., Reyes, M., Serra, E., & Garcia, F. (2019). Parenting Styles and Aggressive Adolescents: Relationships with Self-esteem and Personal Maladjustment. *The European Journal of Psychology Applied to Legal Context, 12*(1)*,* 1 - 10. https://doi.org/10.5093/ejpalc2020a1

Perini, G., Cotta Ramusino, M., Sinforiani, E., Bernini, S., Petrachi, R., & Costa, A. (2019). Cognitive impairment in depression: recent advances and novel treatments. *Neuropsychiatric disease and treatment*, *15*, 1249–1258. https://doi.org/10.2147/NDT.S199746

Peng, P., & Miller, A. C. (2016). Does attention training work? A selective meta-analysis to explore the effects of attention training and moderators. *Learning and Individual Differences, 45,* 77–87. https://doi.org/10.1016/j.lindif.2015.11.012

Peh, O. H., Rapisarda, A., & Lee, J. (2019). Childhood adversities in people at ultra-high risk (UHR) for psychosis: a systematic review and meta-analysis. *Psychological medicine*, *49*(7), 1089–1101. https://doi.org/10.1017/S003329171800394X

Petrill, S. A., & Deater-Deckard, K. (2004). The heritability of general cognitive ability: A within-family adoption design. *Intelligence, 32*(4), 403–409. https://doi.org/10.1016/j.intell.2004.05.001

Piaget, J. (1926). *The language and thought of the child.* Harcourt, Brace.

Pinto-Gouveia, J., Rijo, D., & Salvador, M. C. (2003). Tradução e Adaptação do Inventário de Estilos Parentais de Young. Unpublished Manuscript. [Young Parenting Inventory: Portuguese version].

Pinto-Gouveia, J., Dinis, A., Gregório, S., & Pinto, P. (2013). Questionário de Fusão Cognitiva: Versão Portuguesa. Unpublished manuscript. [Cognitive fusion questionnaire: Portuguese version].

Platts, H., Mason, O., & Tyson, M. (2005). Early maladaptive schemas and adult attachment in a UK clinical population. *Psychology and psychotherapy*, *78*(Pt 4), 549–564. https://doi.org/10.1348/147608305X41371

Plonsker, R., Gavish Biran, D., Zvielli, A., & Bernstein, A. (2017). Cognitive fusion and emotion differentiation: does getting entangled with our thoughts dysregulate the generation, experience and regulation of emotion?. *Cognition & emotion*, *31*(6), 1286–1293. https://doi.org/10.1080/02699931.2016.1211993

Plomin, R., DeFries, J. C., & Loehlin, J. C. (1977). Genotype-environment interaction and correlation in the analysis of human behavior. *Psychological Bulletin, 84*(2), 309–322. https://doi.org/10.1037/0033-2909.84.2.309

Plomin, R., DeFries, J. C., Knopik, V. S., & Neiderhiser, J. M. (2016). Top 10 Replicated Findings From Behavioral Genetics. *Perspectives on psychological science: a journal of the Association for Psychological Science*, *11*(1), 3–23. https://doi.org/10.1177/1745691615617439

Prasko, J., Grambal, A., Kasalova, P., Kamardova, D., Ociskova, M., Holubova, M., Vrbova, K., Sigmundova, Z., Latalova, K., Slepecky, M., & Zatkova, M. (2016). Impact of dissociation on treatment of depressive and anxiety spectrum disorders with and without personality disorders. *Neuropsychiatric Disease and Treatment, 12,* Article 2659-2676.

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences, 1*(4), 515–526. https://doi.org/10.1017/S0140525X00076512

Prebble, S. C., Addis, D. R., & Tippett, L. J. (2013). Autobiographical memory and sense of self. *Psychological bulletin*, *139*(4), 815–840. https://doi.org/10.1037/a0030146

Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research & Practice, 19*(3), 276–288. https://doi.org/10.1037/h0088437

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390–395. https://doi.org/10.1037/0022-006X.51.3.390

Polich J. (2007). Updating P300: an integrative theory of P3a and P3b. *Clinical neurophysiology: official journal of the International Federation of Clinical Neurophysiology*, *118*(10), 2128–2148. https://doi.org/10.1016/j.clinph.2007.04.019

Pomarol-Clotet, E., Salvador, R., Sarro, S., Gomar, J., Vila, F., Martinez, A., Guerrero, A., Ortiz-Gil, J., Sans-Sansa, B., Capdevila, A., Cebamanos, J. M. & McKenna, P. J. (2008). Failure to deactivate in the prefrontal cortex in schizophrenia: dysfunction of the default mode network? *Psychol Med38*, 1185-93.

Posner. M. I (2012). *Cognitive Neuroscience of Attention*. New York: Guilford.

Popov, S. (2019). When is Unconditional Self-Acceptance a Better Predictor of Mental Health than Self-Esteem? *Journal of Rational-Emotive Cognitive-Behavior Therapy, 37,* 251–261. doi: 10.1007/s10942-018-0310-x

Popov, S., Biro, M., & Radanović, J. (2016). Unconditional self-acceptance and mental health in ego-provoking experimental context. *Suvremena psihologija, 19*(1), 71–80.

Popovic, D., Schmitt, A., Kaurani, L., Senner, F., Papiol, S., Malchow, B., Fischer, A., Schulze, T. G., Koutsouleris, N., & Falkai, P. (2019). Childhood Trauma in Schizophrenia: Current Findings and Research Perspectives. *Frontiers in neuroscience*, *13*, 274. https://doi.org/10.3389/fnins.2019.00274

Poucinho, F., Madeira, N., Marques, D., Bettencourt, D., & Relvas, J. (2011). Psicoterapia e Neurociências: o que muda no cérebro. *Psiquiatria Clínica, 32*, (1), pp.5-15.

Rabinak, C. A., Angstadt, M., Welsh, R. C., Kenndy, A. E., Lyubkin, M., Martis, B., & Phan, K. L. (2011). Altered amygdala resting-state functional connectivity in post-traumatic stress disorder. *Frontiers in psychiatry*, *2*, 62. https://doi.org/10.3389/fpsyt.2011.00062

Rachman S. (1980). Emotional processing. *Behaviour research and therapy*, *18*(1), 51–60. https://doi.org/10.1016/0005-7967(80)90069-8

Raes, F. (2011). The effect of self-compassion on the development of depression symptoms in a non-clinical sample. *Mindfulness*, *2*, 33-36. http://dx.doi.org/10.1007/s12671-011-0040-y

Raichlen, D. A., & Polk, J. D. (2013). Linking brains and brawn: exercise and the evolution of human neurobiology. *Proceedings. Biological sciences*, *280*(1750), 20122250. https://doi.org/10.1098/rspb.2012.2250

Raichle, M. E., & Snyder, A. Z. (2007). A default mode of brain function: a brief history of an evolving idea. *NeuroImage*, *37*(4), 1083–1099. https://doi.org/10.1016/j.neuroimage.2007.02.041

Rafaeli, E., Bernstein, D. P., & Young, J. (2011). *The CBT distinctive features series. Schema therapy: Distinctive features.* New York, NY, US: Routledge/Taylor & Francis Group

Raque-Bogdan, T. L., Ericson, S. K., Jackson, J., Martin, H. M., & Bryan, N. A. (2011). Attachment and mental and physical health: self-compassion and mattering as mediators. *Journal of counseling psychology*, *58*(2), 272–278. https://doi.org/10.1037/a0023041

Rauch, S. L., Whalen, P. J., Shin, L. M., McInerney, S. C., Macklin, M. L., Lasko, N. B., et al. (2000). Exaggerated amygdala response to masked facial stimuli in posttraumatic stress disorder: a functional MRI study. *Biological Psychiatry*, *47*(9), 769-776.

Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult attachment measures: a 25-year review. *Journal of psychosomatic research, 69*(4), 419–432. https://doi.org/10.1016/j.jpsychores.2009.08.006

Renner, F., Lobbestael, J., Peeters, F., Arntz, A., & Huibers, M. (2012). Early maladaptive schemas in depressed patients: stability and relation with depressive symptoms over the course of treatment. *Journal of affective disorders*, *136*(3), 581–590. https://doi.org/10.1016/j.jad.2011.10.027

Ray, C., Phillips, L., & Weir, W. R. (1993). Quality of attention in chronic fatigue syndrome: Subjective reports of everyday attention and cognitive difficulty, and performance on tasks of focused attention. *British Journal of Clinical Psychology, 32*(3), 357–364. https://doi.org/10.1111/j.2044-8260.1993.tb01068.x

Rey, A. (2002). Teste de cópia de figuras complexas (2ª ed.; CEGOC-TEA, Adapt.). Lisboa: CEGOC. (Trabalho original publicado em 1959).

Reeve, J., & Lee, W. (2019). A neuroscientific perspective on basic psychological needs. *Journal of personality*, *87*(1), 102–114. https://doi.org/10.1111/jopy.12390

Ridley. M. (2003). *Nature via Nurture: Genes, Experience, and What Makes Us Human*. New York: HarperCollins. ISBN 1-84115-745-7.

Rijo, D. (2009). *Esquemas mal-adaptativos precoces: validação do conceito e dos métodos de avaliação*. Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra. DOI: http://hdl.handle.net/10316/18486

Rijo, D. (2017). O questionário de esquemas de Young (YSQ-S3). In Gonçalves, M., Simões, M. R., & Almeida, L. (Eds.), *Psicologia clínica e da saúde: instrumentos de avaliação* (pp. 159–173). Lisboa: PACTOR.

Riso, L. P., Froman, S. E., Raouf, M., Gable, P., Maddux, R. E., Turini-Santorelli, N., Penna, S., Blandino, J. A., Jacobs, C. H., & Cherry, M. (2006). The Long-Term Stability of Early Maladaptive Schemas. *Cognitive Therapy and Research, 30*(4), 515–529. https://doi.org/10.1007/s10608-006-9015-z

Roelofs, J., Lee, C., Ruijten, T., & Lobbestael, J. (2011). The mediating role of early maladaptive schemas in the relation between quality of attachment relationships and symptoms of depression in adolescents. *Behavioural and cognitive psychotherapy*, *39*(4), 471–479. https://doi.org/10.1017/S1352465811000117

Roelofs, J., Onckels, L., & Muris, P. (2013). Attachment Quality and Psychopathological Symptoms in Clinically Referred Adolescents: The Mediating Role of Early Maladaptive Schema. *Journal of child and family studies*, *22*(3), 377–385. https://doi.org/10.1007/s10826-012-9589-x

Rolf, J. E., Masten, A. S., Cicchetti, D., Nuechterlein, K. H., & Weintraub, S. (Eds.). (1990). *Risk and protective factors in the development of psychopathology.* Cambridge University Press. https://doi.org/10.1017/CBO9780511752872

Rogers, C. R. (1965). Client-centered therapy: Its current practice, implications and theory. Boston: Houghton Mifflin.

Romaniuk, L., Sandu, A. L., Waiter, G. D., McNeil, C. J., Xueyi, S., Harris, M. A., Macfarlane, J. A., Lawrie, S. M., Deary, I. J., Murray, A. D., Delgado, M. R., Steele, J. D., McIntosh, A. M., & Whalley, H. C. (2019). The Neurobiology of Personal Control During Reward Learning and Its Relationship to Mood. *Biological psychiatry. Cognitive neuroscience and neuroimaging*, *4*(2), 190–199. https://doi.org/10.1016/j.bpsc.2018.09.015

Rose, R. J., Dick, D. M., Viken, R. J., & Kaprio, J. (2001). Gene-environment interaction in patterns of adolescent drinking: regional residency moderates longitudinal influences on alcohol use. *Alcoholism, clinical and experimental research*, *25*(5), 637–643.

Rosenzweig, E. S., & Barnes, C. A. (2003). Impact of aging on hippocampal function: plasticity, network dynamics, and cognition. *Progress in neurobiology*, *69*(3), 143–179. https://doi.org/10.1016/s0301-0082(02)00126-0

Roser, M., & Gazzaniga, M. S. (2004). Automatic Brains—Interpretive Minds. *Current Directions in Psychological Science, 13*(2), 56–59. https://doi.org/10.1111/j.0963-7214.2004.00274.x

Royle, J., & Lincoln, N. B. (2008). The Everyday Memory Questionnaire-revised: development of a 13-item scale. *Disability and Rehabilitation*, *30*(2), 114–121. https://doi.org/10.1080/09638280701223876

Roy, M., Shohamy, D., & Wager, T. D. (2012). Ventromedial prefrontal-subcortical systems and the generation of affective meaning. *Trends in cognitive sciences*, *16*(3), 147–156. https://doi.org/10.1016/j.tics.2012.01.005

Rubin, D. C., & Talarico, J. M. (2009). A comparison of dimensional models of emotion: evidence from emotions, prototypical events, autobiographical memories, and words. *Memory (Hove, England)*, *17*(8), 802–808. https://doi.org/10.1080/09658210903130764

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39*(6), 1161–1178. https://doi.org/10.1037/h0077714

Ryle, A. (2005). *Cognitive Analytic Therapy.* In J. C. Norcross & M. R. Goldfried (Eds.), *Oxford series in clinical psychology. Handbook of psychotherapy integration* (p. 196–217). Oxford University Press. https://doi.org/10.1093/med:psych/9780195165791.003.0009

Saariaho, A. S., Saariaho, T. H., Mattila, A. K., Karukivi, M., & Joukamaa, M. I. (2015). Alexithymia and Early Maladaptive Schemas in chronic pain patients. *Scandinavian journal of psychology*, *56*(4), 428–437. https://doi.org/10.1111/sjop.12226

Safran, J. D., & Muran, J. C. (2000). Resolving therapeutic alliance ruptures: Diversity and integration. *Journal of Clinical Psychology, 56*(2), 233–243. https://doi.org/10.1002/(SICI)1097-4679(200002)56:2<233::AID-JCLP9>3.0.CO;2-3

Safran, J.D., Muran, J.C., & Eubanks--Carter, C. (2011) Repairing alliance ruptures. *Psychotherapy, 48*, 80--87.

Saint-Martin C., Valls M., Rousseau A., Callahan S., Chabrol H. (2013). Psychometric evaluation of a shortened version of the 40-item Defense Style Questionnaire. International *Journal of Psychology & Psychological Therapy, 13*(2), 215–224. doi:.10.1016/j.sbspro.2015.03.076

Samoilov, A., & Goldfried, M. R. (2000). Role of emotion in cognitive-behavior therapy. *Clinical Psychology: Science and Practice, 7*(4), 373–385. https://doi.org/10.1093/clipsy/7.4.373

Samuelson K. W. (2011). Post-traumatic stress disorder and declarative memory functioning: a review. *Dialogues in clinical neuroscience*, *13*(3), 346–351. https://doi.org/10.31887/DCNS.2011.13.2/ksamuelson

Santoft, F., Axelsson, E., Öst, L. G., Hedman-Lagerlöf, M., Fust, J., & Hedman-Lagerlöf, E. (2019). Cognitive behaviour therapy for depression in primary care: systematic review and meta-analysis. *Psychological medicine*, *49*(8), 1266–1274. https://doi.org/10.1017/S0033291718004208

Saraladevi, K., & Nithiya Amirtham, S. (2013). Cognitive behavior therapy (CBT) and relaxation therapy change psychological and biological variables. *International Journal of Innovative Research in Science, 2(5)*, 1640- 1650.

Sakiris, N., & Berle, D. (2019). A systematic review and meta-analysis of the Unified Protocol as a transdiagnostic emotion regulation-based intervention. *Clinical psychology review*, *72*, 101751. https://doi.org/10.1016/j.cpr.2019.101751

Scarvalone, P., Fox, M., & Safran, J. D. (2005). *Interpersonal Schemas: Clinical Theory, Research, and Implications.* In M. W. Baldwin (Ed.), *Interpersonal cognition* (p. 359–387). Guilford Press.

Schiele, M. A., Gottschalk, M. G., & Domschke, K. (2020). The applied implications of epigenetics in anxiety, affective and stress-related disorders - A review and synthesis on psychosocial stress, psychotherapy and prevention. *Clinical psychology review*, *77*, 101830. https://doi.org/10.1016/j.cpr.2020.101830

Schatzman. M. (2009). *Early maladaptive schemas mediating the relationship between perceptions of early parenting and depression and anxiety*. Theses and Dissertations. 668. https://rdw.rowan.edu/etd/668

Schore, A. N. (2003). *Affect regulation and the repair of the self.* W W Norton & Co.

Shaffer, D. R., & Kipp, K. (2014). *Developmental psychology: Childhood and adolescence* (9th ed.). Boston: Cengage Learning.

Shapiro, F. (2001). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures* (2nd ed.). Guilford Press.

Saunders, B., Milyavskaya, M., Etz, A., Randles, D., & Inzlicht, M. (2018). Reported self-control is not meaningfully associated with inhibition-related executive function: A Bayesian analysis. *Collabra: Psychology*, *4*(1), [39]. https://doi.org/10.1525/collabra.134

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology, 80*(2), 325–339. https://doi.org/10.1037/0022-3514.80.2.325

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2013). *Mindfulness-based cognitive therapy for depression* (2nd ed.). The Guilford Press.

Semerari, A., Carcione, A., Dimaggio, G., Falcone, M., Nicol_o, G., Procacci, M., & Alleva, G. (2003). How to evaluate metacognitive functioning in psychotherapy? The metacognition assessment scale and its applications. *Clinical Psychology & Psychotherapy, 10, 238–261. doi:10.1002/cpp.362*

Semrud-Clikeman M., Ellison P. A. T. (2009) Introduction to Child Clinical Neuropsychology. In: Child Neuropsychology. Springer, New York, NY. http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/978-0-387-88963-4_ 1

Schmitt, J. E., Wallace, G. L., Rosenthal, M. A., Molloy, E. A., Ordaz, S., Lenroot, R., Clasen, L. S., Blumenthal, J. D., Kendler, K. S., Neale, M. C., & Giedd, J. N. (2007). A multivariate analysis of neuroanatomic relationships in a genetically informative pediatric sample. *NeuroImage*, *35*(1), 70–82. https://doi.org/10.1016/j.neuroimage.2006.04.232

Schienle, A., Ebner, F., & Schäfer, A. (2011). Localized gray matter volume abnormalities in generalized anxiety disorder. *European archives of psychiatry and clinical neuroscience*, *261*(4), 303–307. https://doi.org/10.1007/s00406-010-0147-5

Schunk, D. H. (1996). Goal and self-evaluative influences during children's cognitive skill learning. *American Educational Research Journal, 33*(2), 359–382. https://doi.org/10.2307/1163289

Slagt, M., Dubas, J. S., Deković, M., & van Aken, M. A. (2016). Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological bulletin*, *142*(10), 1068–1110. https://doi.org/10.1037/bul0000061

Shaffer, D.R. & Kipp, K. (2013). *Developmental Psychology: Childhood and Adolescence*. Cengage Learning.

Sheline, Y. I., Barch, D. M., Donnelly, J. M., Ollinger, J. M., Snyder, A. Z., & Mintun, M. A. (2001). Increased amygdala response to masked emotional faces in depressed subjects resolves with antidepressant treatment: an fMRI study. *Biological psychiatry*, *50*(9), 651–658. https://doi.org/10.1016/s0006-3223(01)01263-x

Shiffrin, R. M., & Schneider, W. (1977). Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review, 84*(2), 127–190. https://doi.org/10.1037/0033-295X.84.2.127

Shi, R., Sharpe, L., & Abbott, M. (2019). A meta-analysis of the relationship between anxiety and attentional control. *Clinical psychology review*, *72*, 101754. https://doi.org/10.1016/j.cpr.2019.101754

Shonkoff, J. P., Garner, A. S., Committee on Psychosocial Aspects of Child and Family Health, Committee on Early Childhood, Adoption, and Dependent Care, & Section on Developmental and Behavioral Pediatrics (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, *129*(1), e232–e246. https://doi.org/10.1542/peds.2011-2663

Schore, A. N. (2003). *Affect regulation and the repair of the self.* New York, NY: Norton

Shulman, G. L., Fiez, J. A., Corbetta, M., Buckner, R. L., Miezin, F. M., Raichle, M. E., & Petersen, S. E. (1997). Common Blood Flow Changes across Visual Tasks: II. Decreases in Cerebral Cortex. *Journal of cognitive neuroscience*, *9*(5), 648–663. https://doi.org/10.1162/jocn.1997.9.5.648

Siegel, D. J. (2012). *The developing mind. How relationships and the brain interact to shape who we are* (2nd ed.). New York: Guilford Press.

Silberstein, L. R., Tirch, D., Leahy, R. L., & McGinn, L. (2012). Mindfulness, psychological flexibility and emotional schemas. *International Journal of Cognitive Therapy, 5*(4), 406–419. https://doi.org/10.1521/ijct.2012.5.4.406

Simeone-DiFrancesco, C., Roediger, E., & Stevens, B. A. (2015). *Schema therapy with couples: A practitioner's guide to healing relationships.* Wiley-Blackwell. https://doi.org/10.1002/9781118972700

Simard, V., Nielsen, T. A., Tremblay, R. E., Boivin, M., & Montplaisir, J. Y. (2008). Longitudinal study of bad dreams in preschool-aged children: prevalence, demographic correlates, risk and protective factors. *Sleep*, *31*(1), 62–70. https://doi.org/10.1093/sleep/31.1.62

Simões, M. R., Pinho, M. S., Lopes, A. F., Santos, L., Alfaiate, C., Fernandes, E. e cols (2007). Teste de fluência verbal semântica. Em M. R. Simões, C. Machado, M. M. Gonçalves & L. S. Almeida (Ed.), *Avaliação psicológica: Instrumentos validados para a população portuguesa* (Vol. III, pp. 281-304). Coimbra: Quarteto.

Skinner, B. F. (1963). Operant behavior. *American Psychologist, 18*(8), 503–515. https://doi.org/10.1037/h0045185

Skinner, E. A., & Zimmer-Gembeck, M. J. (2007). The development of coping. *Annual review of psychology*, *58*, 119–144. https://doi.org/10.1146/annurev.psych.58.110405.085705

Snyder, H. R. (2013). Major depressive disorder is associated with broad impairments on neuropsychological measures of executive function: A meta-analysis and review. *Psychological Bulletin, 139*(1), 81–132. https://doi.org/10.1037/a0028727

Snyder, H. R., Miyake, A., & Hankin, B. L. (2015). Advancing understanding of executive function impairments and psychopathology: bridging the gap between clinical and cognitive approaches. *Frontiers in psychology*, *6*, 328. https://doi.org/10.3389/fpsyg.2015.00328

Srivastava, S., Tamir, M., McGonigal, K. M., John, O. P., & Gross, J. J. (2009). The social costs of emotional suppression: a prospective study of the transition to college. *Journal of personality and social psychology*, *96*(4), 883–897. https://doi.org/10.1037/a0014755

Stallard, P. (2007). Early Maladaptive Schemas in children: Stability and differences between a community and a clinic referred sample. *Clinical Psychology & Psychotherapy*, *14*(1), 10-18. https://doi.org/10.1002/cpp.511

Stevenson, J. C., Emerson, L. M., & Millings, A. (2017). The Relationship Between Adult Attachment Orientation and Mindfulness: a Systematic Review and Meta-

analysis. *Mindfulness*, *8*(6), 1438–1455. https://doi.org/10.1007/s12671-017-0733-y

Soares, A. P., Pinheiro, A. P., Costa, A., Frade, C. S., Comesaña, M., & Pureza, R. (2015). The Adaptation of the International Affective Picture System (IAPS) for European Portuguese. *Behavior Research Methods, 47*(4), 1159-1177

Sohlberg, M. M., McLaughlin, K. A., Pavese, A., Heidrich, A., & Posner, M. I. (2000). Evaluation of attention process training and brain injury education in persons with acquired brain injury. *Journal of clinical and experimental neuropsychology*, *22*(5), 656–676. https://doi.org/10.1076/1380-3395(200010)22:5;1-9;FT656

Sol, A & Vasco, A. B. (2017). Relationships between the regulation of psychological needs satisfaction and symptomatology. *Psicologia, 31*, 1.

Solbakken, O. A., Hansen, R. S., Havik, O. E., & Monsen, J. T. (2012). Affect integration as a predictor of change: affect consciousness and treatment response in open-ended psychotherapy. *Psychotherapy research : journal of the Society for Psychotherapy Research*, *22*(6), 656–672. https://doi.org/10.1080/10503307.2012.700871

Sorrells, S. F., Paredes, M. F., Cebrian-Silla, A., Sandoval, K., Qi, D., Kelley, K. W., James, D., Mayer, S., Chang, J., Auguste, K. I., Chang, E. F., Gutierrez, A. J., Kriegstein, A. R., Mathern, G. W., Oldham, M. C., Huang, E. J., Garcia-Verdugo, J. M., Yang, Z., & Alvarez-Buylla, A. (2018). Human hippocampal neurogenesis drops sharply in children to undetectable levels in adults. *Nature*, *555*(7696), 377–381. https://doi.org/10.1038/nature25975

Soto, A., Smith, T. B., Griner, D., Domenech Rodríguez, M., & Bernal, G. (2018). Cultural adaptations and therapist multicultural competence: Two meta-analytic reviews. *Journal of clinical psychology*, *74*(11), 1907–1923. https://doi.org/10.1002/jclp.22679

Soygüt, G., & Cakir, Z. (2009). Ebeveynlik Biçimleri ile Psikolojik Belirtiler Arasindaki Ilişkilerde Kişilerarasi Semalarin Araci Rolü: Sema Odakli Bir Bakiş [The mediating role of the interpersonal schemas between parenting styles and psychological symptoms: a schema focused view]. *Turk psikiyatri dergisi = Turkish journal of psychiatry*, *20*(2), 144–152.

Stern, E. R., Fitzgerald, K. D., Welsh, R. C., Abelson, J. L., & Taylor, S. F. (2012). Resting-state functional connectivity between fronto-parietal and default mode networks in obsessive-compulsive disorder. *PloS one*, *7*(5), e36356. https://doi.org/10.1371/journal.pone.0036356

Stiles, W. B., Hill, C. E., & Elliott, R. (2015). Looking both ways. *Psychotherapy Research, 25*(3), 282–293. https://doi.org/10.1080/10503307.2014.981681

Sudbrack, R., Manfro, P. H., Kuhn, I. M., de Carvalho, H. W., & Lara, D. R. (2015). What doesn't kill you makes you stronger and weaker: how childhood trauma relates to temperament traits. *Journal of psychiatric research*, *62*, 123–129. https://doi.org/10.1016/j.jpsychires.2015.01.001

Struck, N., Krug, A., Yuksel, D., Stein, F., Schmitt, S., Meller, T., Brosch, K., Dannlowski, U., Nenadić, I., Kircher, T., & Brakemeier, E. L. (2020). Childhood maltreatment and adult mental disorders - the prevalence of different types of maltreatment and associations with age of onset and severity of symptoms. *Psychiatry research*, *293*, 113398. https://doi.org/10.1016/j.psychres.2020.113398

Stuss, D. T., & Knight, R. T. (Eds.). (2013). *Principles of frontal lobe function* (2nd ed.). New York: Oxford University Press.

Suciu, B., Paunescu, R., & Miclutia, I. (2017). Memory, attention and language deficits in major depressive disorder. *European Psychiatry, 41*(S1), S543-S543. doi:10.1016/j.eurpsy.2017.01.756

Sullivan R. M. (2012). The Neurobiology of Attachment to Nurturing and Abusive Caregivers. *The Hastings law journal*, *63*(6), 1553–1570.

Sussman, E., & Steinschneider, M. (2006). Neurophysiological evidence for context-dependent encoding of sensory input in human auditory cortex. *Brain research*, *1075*(1), 165–174. https://doi.org/10.1016/j.brainres.2005.12.074

Svendsen, J. L., Schanche, E., Osnes, B., Vøllestad, J., Visted, E., Dundas, I., Nordby, H., Binder, P. E., & Sørensen, L. (2020). Is Dispositional Self-Compassion Associated With Psychophysiological Flexibility Beyond Mindfulness? An Exploratory Pilot Study. *Frontiers in psychology*, *11*, 614. https://doi.org/10.3389/fpsyg.2020.00614

Taconnat, L., Baudouin, A., Fay, S., Raz, N., Bouazzaoui, B., El-Hage, W., Isingrini, M., & Ergis, A. M. (2010). Episodic memory and organizational strategy in free recall in unipolar depression: the role of cognitive support and executive functions. *Journal of clinical and experimental neuropsychology*, *32*(7), 719–727. https://doi.org/10.1080/13803390903512645

Tamietto, M., & de Gelder, B. (2010). Neural bases of the non-conscious perception of emotional signals. *Nature reviews. Neuroscience*, *11*(10), 697–709. https://doi.org/10.1038/nrn2889

Tatarsky, A. (2003). Harm reduction psychotherapy: Extending the reach of traditionalsubstance use treatment. Journal of Substance Abuse Treatment, 25, 249–256

Teachman, B. A., Drabick, D. A., Hershenberg, R., Vivian, D., Wolfe, B. E., & Goldfried, M. R. (2012). Bridging the gap between clinical research and clinical practice: introduction to the special section. *Psychotherapy (Chicago, Ill.)*, *49*(2), 97–100. https://doi.org/10.1037/a0027346

Thimm, J. C. (2013). Interpersonal problems: A of the YSQ-SF. *International Journal of Psychology & Psychological Therapy*, 13, 1, 113-124.

Thimm, J. C., & Holland, J. M. (2017). Early Maladaptive Schemas, Meaning Making, and Complicated Grief Symptoms after Bereavement. *International Journal of Stress Management. Advance online publication.* http://dx.doi.org/10.1037/str0000042

Treves, I. N., Tello, L. Y., Davidson, R. J., & Goldberg, S. B. (2019). The relationship between mindfulness and objective measures of body awareness: A meta-analysis. *Scientific reports*, *9*(1), 17386. https://doi.org/10.1038/s41598-019-53978-6

Trenerry, M. R., Crosson, B., DeBoe, J. & Leber, W. R. (1995). *Stroop neuropsychological screening test (Manual).* Tampa: Psychological Assessment Resources.

Troyer, A. K., & Rich, J. B. (2002). Psychometric properties of a new metamemory questionnaire for older adults. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 57*(1), P19–P27. https://doi.org/10.1093/geronb/57.1.P19

Tyrka, A. R., Wyche, M. C., Kelly, M. M., Price, L. H., & Carpenter, L. L. (2009). Childhood maltreatment and adult personality disorder symptoms: influence of maltreatment type. *Psychiatry research*, *165*(3), 281–287. https://doi.org/10.1016/j.psychres.2007.10.017

Tryon, W. W. (2014). *Cognitive neuroscience and psychotherapy: Network principles for a unified theory.* Elsevier Academic Press.

Tryon, G. S., Birch, S. E., & Verkuilen, J. (2018). Meta-analyses of the relation of goal consensus and collaboration to psychotherapy outcome. *Psychotherapy, 55*(4), 372–383. https://doi.org/10.1037/pst0000170

Tucker-Drob, E. M., Briley, D. A., & Harden, K. P. (2013). Genetic and Environmental Influences on Cognition Across Development and Context. *Current directions in*

psychological science, *22*(5), 349–355. https://doi.org/10.1177/0963721413485087

Tyrka, A. R., Wyche, M. C., Kelly, M. M., Price, L. H., & Carpenter, L. L. (2009). Childhood maltreatment and adult personality disorder symptoms: influence of maltreatment type. *Psychiatry research*, *165*(3), 281–287. https://doi.org/10.1016/j.psychres.2007.10.017

Urbina, S. (2007). *Fundamentos da testagem psicológica*. Porto Alegre: Artmed.

Vallat-Azouvi, C., Pradat-Diehl, P. and Azouvi, P. (2012) The Working Memory Questionnaire: A Scale to Assess Everyday Life Problems Related to Deficits of Working Memory in Brain Injured Patients. *Neuropsychological Rehabilitation: An International Journal, 22*, 634-649. http://dx.doi.org/10.1080/09602011.2012.681110

Vaillant G. E. (2011). Involuntary coping mechanisms: a psychodynamic perspective. *Dialogues in clinical neuroscience*, *13*(3), 366–370. https://doi.org/10.31887/DCNS.2011.13.2/gvaillant

Vaillant G.E. (2020) Defense Mechanisms. In: Zeigler-Hill V., Shackelford T.K. (eds) *Encyclopedia of Personality and Individual Differences.* Springer, Cham. https://doi.org/10.1007/978-3-319-24612-3_1372

Van der Kolk, B. A. (2005). Developmental trauma disorder: toward a rational diagnosis for children with complex trauma histories. *Psychiatr. Ann. 35*, 401–408. doi: 10.3928/00485713-20050501-06

Van Buuren, M., Vink, M., & Kahn, R. S. (2012). Default-mode network dysfunction and self-referential processing in healthy siblings of schizophrenia patients. *Schizophrenia research*, *142*(1-3), 237–243. https://doi.org/10.1016/j.schres.2012.09.017

Vanderbilt-Adriance, E., & Shaw, D. S. (2008). Conceptualizing and re-evaluating resilience across levels of risk, time, and domains of competence. *Clinical child and family psychology review*, *11*(1-2), 30–58. https://doi.org/10.1007/s10567-008-0031-2

Vargas, T., Lam, P. H., Azis, M., Osborne, K. J., Lieberman, A., & Mittal, V. A. (2019). Childhood Trauma and Neurocognition in Adults With Psychotic Disorders: A Systematic Review and Meta-analysis. *Schizophrenia bulletin*, *45*(6), 1195–1208. https://doi.org/10.1093/schbul/sby150

Vasco, A. B. (2001). Fundamentos para um modelo integrativo de "complementaridade paradigmática". *Psicologia*, XV (2), 219-226. [Fundamentals for an integrative model of "paradigmatic complementarity"]

Vasco, A. B. (2005). A Conceptualização de Caso no Modelo de Complementaridade Paradigmática: Variedade e Integração. *Psychologica*. 40, 11-36. [Case Conceptualization in the Model of Paradigmatic Complementarity: Variety and Integration]

Vasco, A. B. (2006). Entre nuvens e relógios: Sequência temporal de objetivos estratégicos e integração em psicoterapia. *Revista Portuguesa de Psicologia, 39,* 9-31.

Vasco, A. B. (2013). Sinto e Penso, logo Existo! Abordagem Integrativa das Emoções. *Revista Serviço de Psiquiatria do Hospital Prof Doutor Fernando Fonseca, EPE*. 11. 1. Lisboa: Psilogos.

Vasco, A.B., & Vaz-Velho, C. (2010, maio). The integrative essence of seven dialetical needs polarities. *Comunicação apresentada na "XXVI International Conference of the Society for the Exploration of Psychoterapy Integration"*, Florença, Itália

Vasco, A. B., Bernardo, F., Cadilha, N., Calinas, L., Conde, E., Fonseca, T., & Rucha, S. (2012). *Escala de Regulação da Satisfação de Necessidades Psicológicas (ERSN) (Psychological needs satisfaction regulation scale (ERNS)) (unpublished document)*. Lisbon: Faculty of Psychology of University of Lisbon.

Vasco, A. B., Conceição, N., Silva, A. N., Ferreira, J. F., & Vaz-Velho, C. (2018). *O (meta)modelo de complementaridade paradigmática (MCP)*. In I. Leal (Ed.), *Psicoterapias*. Lisbon: Pactor. [Paradigmatic Complementarity Metamodel].

Vaz, F., & Martins, C. (2009). Diferenciação e Regulação Emocional na Idade Adulta: Tradução e validação de dois instrumentos de avaliação para a população portuguesa. [Differentiation and Emotional Regulation in Adulthood: Translation and validation of two assessment instruments for the Portuguese Population.] Master thesis in Faculty of Psychology of University of Minho.

Vaz, F. (2018). Emotional processes in psychological adjustment and disorder: their characteristics and evolution during the therapeutic process. Doctoral thesis in Faculty of Psychology of University of Lisbon.

Veglia, F., & Di Fini, G. (2017). Life themes and interpersonal motivational systems in the narrative self-construction. *Frontiers in Psychology, 8,* Article 1897. https://doi.org/10.3389/fpsyg.2017.01897

Veronese, G., & Pepe, A. (2017). Sense of Coherence as a Determinant of Psychological Well-Being Across Professional Groups of Aid Workers Exposed to War Trauma. *Journal of interpersonal violence*, *32*(13), 1899–1920. https://doi.org/10.1177/0886260515590125

Vonderlin, R., Kleindienst, N., Alpers, G. W., Bohus, M., Lyssenko, L., & Schmahl, C. (2018). Dissociation in victims of childhood abuse or neglect: a meta-analytic review. *Psychological medicine*, *48*(15), 2467–2476. https://doi.org/10.1017/S0033291718000740

Wachtel, P. L., & Gagnon, G. J. (2019). Cyclical psychodynamics and integrative relational psychotherapy; In J. C. Norcross & M. R. Goldfried (Eds.); *Handbook of psychotherapy integration* (3rd ed.); Oxford; New York; 184-206. doi: 10.1093/med- psych/9780190690465.003.0009

Waddington, C. H. (Ed.). (1968–1971). *Towards a theoretical biology* (Vol. 1–4). Edinburgh University Press.

Wahlberg, K. E., Wynne, L. C., Oja, H., Keskitalo, P., Pykäläinen, L., Lahti, I., Moring, J., Naarala, M., Sorri, A., Seitamaa, M., Läksy, K., Kolassa, J., & Tienari, P. (1997). Gene-environment interaction in vulnerability to schizophrenia: findings from the Finnish Adoptive Family Study of Schizophrenia. *The American journal of psychiatry*, *154*(3), 355–362. https://doi.org/10.1176/ajp.154.3.355

Walburg, V., & Chiaramello, S. (2015). Link between early maladaptive schemas and defense mechanisms. *European Review of Applied Psychology / Revue Européenne de Psychologie Appliquée, 65*(5), 221–226. https://doi.org/10.1016/j.erap.2015.07.003

Waris, O., Soveri, A., Lukasik, K. M., Lehton. M., Laine. M (2018). Working memory and the Big Five. *Personality and Individual Differences, 130*(1):26-35. https://doi.org/10.1016/j.paid.2018.03.027

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*(1), 1–14. https://doi.org/10.1037/h0069608

Watzke, B., Rüddel, H., Jürgensen, R., Koch, U., Kriston, L., Grothgar, B., & Schulz, H. (2010). Effectiveness of systematic treatment selection for psychodynamic and cognitive-behavioural therapy: randomised controlled trial in routine mental healthcare. *The British journal of psychiatry : the journal of mental science*, *197*(2), 96–105. https://doi.org/10.1192/bjp.bp.109.072835

Webb, T. L., Miles, E., & Sheeran, P. (2012). Dealing with feeling: a meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological bulletin*, *138*(4), 775–808. https://doi.org/10.1037/a0027600

Wechsler, D. (2008). WMS-III: Escala de Memória de Wechsler - 3a Edição: Manual Técnico. Lisboa: Cegoc.

Wechsler, D. (2008). WAIS-III: Escala de Intligência de Wechsler para Adultos - III: Manual Técnico. Tea Ediciones.

Welburn, K., Coristine, M., Dagg, P., Pontefract, A., & Jordan, S. (2002). The Schema Questionnaire - Short Form: factor analysis and relationship between schemas and symptoms. *Cognitive Therapy and Research, 26*(4), 519–530.

Welsh, R., & Martin, L. (2013). Revisioning a systemic approach to neuroscience and psychotherapy. *Couple and Family Psychology: Research and Practice, 2*(2), 116-123.

Wells, A. (2000). *Emotional disorders and metacognition: Innovative cognitive therapy.* John Wiley & Sons Ltd.

Wells, A., & Matthews, G. (1994). *Attention and emotion: A clinical perspective.* Lawrence Erlbaum Associates, Inc.

Wiens S. (2006). Subliminal emotion perception in brain imaging: findings, issues, and recommendations. *Progress in brain research*, *156*, 105–121. https://doi.org/10.1016/S0079-6123(06)56006-6

Wennerhold, L., & Friese. L. (2020). Why Self-Report Measures of Self-Control and Inhibition Tasks Do Not Substantially Correlate. *Collabra: Psychology, 6*(1): 9. Doi: https://doi.org/10.1525/collabra.276

Williams, P. G., Rau, H. K., Suchy, Y., Thorgusen, S. R., & Smith, T. W. (2017). On the validity of self-report assessment of cognitive abilities: Attentional control scale associations with cognitive performance, emotional adjustment, and personality. *Psychological Assessment, 29*(5), 519–530. https://doi.org/10.1037/pas0000361

Wilson, B. A., Alderman, N., Burgess, P. W., Emslie, H., & Evans, J. J. (1996). *Behavioural assessment of the dysexecutive syndrome*. Bury St Edmunds, UK: Harcourt Assessment.

Wilson, B. A., Evans, J. J., Emslie, H., Alderman, N., & Burgess, P. (1998). The development of an ecologically valid test for assessing patients with dysexecutive syndrome. *Neuropsychological Rehabilitation, 8*(3), 213–228. https://doi.org/10.1080/713755570

Wolpe, J. (1990). *The practice of behavior therapy* (4th ed.). New York: Pergamon.

Wolf, B. E. (2005). *Understanding and treating anxiety disorders: An integrative approach to healing the wounded self*. Washington, DC: American Psychological Association

Yang, Y., Cao, S., Shields, G. S., Teng, Z., & Liu, Y. (2017). The relationships between rumination and core executive functions: A meta-analysis. *Depression and anxiety*, *34*(1), 37–50. https://doi.org/10.1002/da.22539

Yan, C. G., Chen, X., Li, L., Castellanos, F. X., Bai, T. J., Bo, Q. J., Cao, J., Chen, G. M., Chen, N. X., Chen, W., Cheng, C., Cheng, Y. Q., Cui, X. L., Duan, J., Fang, Y. R., Gong, Q. Y., Guo, W. B., Hou, Z. H., Hu, L., Kuang, L., & Zang, Y. F. (2019). Reduced default mode network functional connectivity in patients with recurrent major depressive disorder. *Proceedings of the National Academy of Sciences of the United States of America, 116*(18), 9078–9083. https://doi.org/10.1073/pnas.1900390116

Young, J. E. (1999). *Young Parenting Inventory (YPI)*. Retrieved from http://www.schematherapy.com/id205.htm

Young, J. E. (1999). *Cognitive therapy for personality disorders: A schema-focused approac*h (3rd ed.). Professional Resources Press.

Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema Therapy. A practitioner's guide*. New York: The Guilford Press.

Young, J. (2005). *The Young Schema Inventory, Standardized Items, 3rd version*. Schema Therapy Institute, New York.

Zatti, C., Rosa, V., Barros, A., Valdivia, L., Calegaro, V. C., Freitas, L. H., Ceresér, K., Rocha, N., Bastos, A. G., & Schuch, F. B. (2017). Childhood trauma and suicide attempt: A meta-analysis of longitudinal studies from the last decade. *Psychiatry research*, *256*, 353–358. https://doi.org/10.1016/j.psychres.2017.06.082

Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The Relationship Between Self-Compassion and Well-Being: A Meta-Analysis. Applied psychology. *Health and well-being, 7(*3), 340–364. https://doi.org/10.1111/aphw.12051

Zhang, Q., Yang, X., Song, H., & Jin, Y. (2020). Cognitive behavioral therapy for depression and anxiety of Parkinson's disease: A systematic review and meta-analysis. *Complementary therapies in clinical practice*, *39*, 101111. https://doi.org/10.1016/j.ctcp.2020.101111

Zilberstein, K. (2014). The use and limitations of attachment theory in child psychotherapy. *Psychotherapy, 51*(1), 93–103. https://doi.org/10.1037/a0030930

Zilcha-Mano, S. (2020). Toward personalized psychotherapy: The importance of the trait-like/state-like distinction for understanding therapeutic change. *American Psychologist.* Advance online publication. https://doi.org/10.1037/amp0000629

Zilmer, E. A., Spiers, M. V., & Culbertson, W. C. (2008). *Principles of Neuropsychology*. 2ºEd. USA: Thomson Wadsworth.

Zlomuzica, A., Preusser, F., Totzeck, C., Dere, E., & Margraf, J. (2016). The impact of different emotional states on the memory for what, where and when features of specific events. *Behavioural brain research*, *298*(Pt B), 181–187. https://doi.org/10.1016/j.bbr.2015.09.037

Zuckerman, M. (1999). *Diathesis-stress models.* In M. Zuckerman, *Vulnerability to psychopathology: A biosocial model* (p. 3–23). American Psychological Association. https://doi.org/10.1037/10316-001

Zwir, I., Del-Val, C., Arnedo, J., Pulkki-Råback, L., Konte, B., Yang, S. S., Romero-
Zaliz, R., Hintsanen, M., Cloninger, K. M., Garcia, D., Svrakic, D. M., Lester,
N., Rozsa, S., Mesa, A., Lyytikäinen, L. P., Giegling, I., Kähönen, M., Martinez,
M., Seppälä, I., Raitoharju, E., … Cloninger, C. R. (2019). Three genetic-
environmental networks for human personality. *Molecular psychiatry*,
10.1038/s41380-019-0579-x. Advance online publication.
https://doi.org/10.1038/s41380-019-0579-x

APPENDIX

Appendix A – Informed consent for online study participation

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Faculdade de Psicologia
UNIVERSIDADE DE LISBOA

Declaração de Consentimento Informado

A presente investigação insere-se no projecto de doutoramento denominado "Tomada de Decisão Clínica Baseada na Evidência: Mudanças Psicológicas Estruturais e Neurológicas Funcionais", realizado na Faculdade de Psicologia da Universidade de Lisboa. Este projecto pretende estudar a complexidade das relações, associações e interacções entre variáveis psicológicas e neuropsicológicas estruturais, assim como variáveis neurofisiológicas funcionais, de forma transversal e longitudinal.

Esta investigação pretende contribuir para a compreensão e desenvolvimento da produção de ciência integrada entre psicologia clínica e neurociências, no intuito de encontrar novas formas de conceptualização de caso e posteriormente, novas formas de intervenção.

A sua participação neste estudo é livre, podendo desistir quando assim o entender. A sua participação irá ocorrer em vários momentos no tempo, com duas partes associadas: preenchimento de um protocolo de questionários on-line e uma sessão em laboratório na Faculdade de Psicologia da Universidade de Lisboa. Se aceitar participar nas duas partes, poderá ser contactado para repetir o procedimento passado cerca de 6 meses e 12 meses, onde terá que realizar novamente o protocolo de questionários e a sessão no laboratório.

A sessão em laboratório está dividida em 2 partes: realização de uma avaliação neuropsicológica e seguidamente, a realização de uma tarefa de tomada de decisão com recurso a eletroencefalografia. As tarefas a desempenhar são inofensivas e não contemplam nenhum risco para o participante. O tempo total esperado é de cerca de uma hora e meia em cada parte.

Todas as respostas são anónimas e confidenciais, sendo apenas manuseadas pelo investigador principal. Os dados serão utilizados exclusivamente para fins de investigação. A sua participação é voluntária e poderá desistir a qualquer momento. Para participar, deverá ter no mínimo 18 anos (até ao final do presente ano), o 9º ano de escolaridade ou equivalente e o domínio da língua portuguesa. Poderá solicitar esclarecimentos adicionais sobre este estudo, e informações pós-estudo, junto do investigador Bruno Faustino através dos e-mails brunofaustino.investigacao@gmail.com e/ou brunofaustino.psicologia@gmail.com, ou ainda através do Professor Doutor António Branco Vasco, através do e-mail abvasco@psicologia.ulisboa.pt.

Muito obrigado pela atenção e colaboração!

Bruno Faustino
António Branco Vasco
Isabel Fonseca

Aceito responder ao conjunto de instrumentos que integram esta investigação, tendo-me sido assegurada a confidencialidade e anonimato dos meus dados pessoais para o referido estudo.

○ Aceito
○ Não aceito

Progresso
0% [   ] 100%

>>

Appendix B – Protocol of online psychological assessment measures

Inventário de Tomada de Decisão Clínica

Relativamente ao seu acompanhamento psicológico/psicoterapêutico e/ou psiquiátrico, indique a etapa que melhor descreve o seu momento actual no seu processo psicoterapêutico.

○ Fase inicial da terapia - Sentir-se motivado/a a abordar os problemas do ponto de vista psicológico; sentir um clima de segurança relativamente ao terapeuta; sentir esperança no processo terapêutico; negociar as regras do processo;

○ Fase secundária - Explorar e experienciar o impacto de situações relevantes; identificar e descobrir novos significados relativamente a si e aos outros; tomar consciência de conflitos e dificuldades; aumentar o conhecimento de si próprio e das relações com os outros;

○ Fase terciária - Perceber as dificuldades à luz do passado e do presente; Desenvolver e construir novas formas de se ver a si e compreender os "problemas"; Identificar padrões e processos de funcionamento e construir novos significados;

○ Fase intermédia - Tomar consciência da responsabilidade em cuidar de si; assumir o compromisso por respeitar as suas necessidades; mobilizar recursos internos para a mudança;

○ Fase avançada - Realizar ações e procedimentos transformadores e promover a mudança; escolher estilos de vida que promovam o desenvolvimento pessoal; gestão de obstáculos à expressão da sua identidade; lidar eficazmente com os problemas e construir planos de acção para os resolver;

○ Fase quase final - Consolidar as aprendizagens no sentido da satisfação de necessidades e expressão da identidade; generalizar as aprendizagens à sua vida e aceitar a inevitabilidade de certos graus de vulnerabilidade;

○ Fase final - Olhar para o futuro, prevenir recaídas e antever dificuldades; antecipar recursos e planos preventivos para lidar com dificuldades; fortalecer a sensação de coerência pessoal e sentido de vida; integrar experiências passadas, presentes e futuras numa narrativa coerente;

Quantas sessões de psicoterapia já realizou no presente processo? (dê um número aproximado).

[   ]

Relativamente ao seu acompanhamento psicológico/psicoterapêutico e/ou psiquiátrico, classifique a qualidade da sua relação com o terapeuta (caso tenha os 2 tipos de acompanhamento, considere aquele a que vai mais frequentemente)

○ Excelente

○ Boa

○ Razoável

○ Fraca

○ Má

QUESTIONÁRIO DE ESQUEMAS DE YOUNG – YSQ – S3

(Young, 2005) traduzido e adaptado por J. Pinto Gouveia, D. Rijo e M.C. Salvador (2005), revista.

Nome_____ Idade _____ Data _____

Estado Civil _____ Grau de Instrução _____ Profissão _____

INSTRUÇÕES: Estão indicadas a seguir algumas afirmações que podemos utilizar quando nos queremos descrever. Por favor, leia cada uma das afirmações e decida até que ponto ela se aplica a si, *ao longo do último ano*. Quando tiver dúvidas, responda baseando-se no que *sente* emocionalmente e não no que pensa ser verdade.

Algumas das afirmações referem-se à sua relação com os seus pais ou companheiro(a). Se alguma destas pessoas faleceu, por favor responda a estas questões com base na relação que tinha anteriormente com elas. Se, actualmente, não tem um(a) companheiro(a) mas teve relacionamentos amorosos no passado, por favor responda com base no seu relacionamento amoroso significativo mais recente.

Para responder até que ponto a afirmação o(a) descreve, utilize a escala de resposta abaixo indicada, escolhendo, de entre as seis respostas possíveis, aquela que melhor se ajusta ao seu caso. Escreva o número da resposta no respectivo espaço em branco.

ESCALA DE RESPOSTA

1 = Completamente falso, isto é, não tem absolutamente nada a ver com o que acontece comigo

2 = Falso na maioria das vezes, isto é, não tem quase nada a ver com o que acontece comigo

3 = Ligeiramente mais verdadeiro do que falso, isto é, tem ligeiramente a ver com o que acontece comigo

4 = Moderadamente verdadeiro, isto é, tem moderadamente a ver com o que acontece comigo

5 = Verdadeiro a maioria das vezes, isto é, tem muito a ver com o que acontece comigo

6 = Descreve-me perfeitamente, isto é, tem tudo a ver com o que acontece comigo

1. _____Não tenho tido ninguém que cuide de mim, que partilhe comigo a sua vida ou que se preocupe realmente com tudo o que me acontece.

2. _____Costumo apegar-me demasiado às pessoas que me são mais próximas porque tenho medo que elas me abandonem.

3. _____Sinto que as pessoas se vão aproveitar de mim.

4. _____Sou um(a) desajustado(a).

5. _____Nenhum homem/mulher de quem eu goste pode gostar de mim depois de conhecer os meus defeitos ou fraquezas.

QUESTIONÁRIO DE ESTADOS MENTAIS RECORRENTES

B. Faustino et al (2021)

(Baseado na Terapia Metacognitiva Interpessoal de Dimaggio e colaboradores, 2007, 2015)

Nome: _____ Género: _____ Idade: _____

Data: _____ Grau de Escolaridade: .... Profissão: _____

Instruções: Vai encontrar algumas afirmações que podem ser usadas para descrever o que pensamos e o que sentimos no dia-a-dia. Por favor, leia cuidadosamente cada afirmação e responda em que grau é que carateriza o que pensa e o que sente **geralmente**, ou seja, **a maior parte do tempo**. Use a escala de resposta em baixo para indicar em que medida as afirmações se aplicam a si. Coloque o número que corresponde à sua resposta em frente de cada afirmação.

Escala de Resposta					
1	2	3	4	5	6
Falso	Falso a maioria das vezes	Algo verdadeiro	Moderadamente verdadeiro	Muitas vezes verdadeiro	Verdadeiro

1. Sinto-me abandonado, sozinho e sem valor. ____
2. Tenho muita dificuldade em identificar-me com alguém. ____
3. Sinto-me ansioso e incapaz de lidar com pessoas mais fortes do que eu. ____
4. Tenho vergonha de ser gozado e humilhado pelas minhas imperfeições. ____
5. Culpo-me por ter magoado algumas pessoas. ____
6. Sinto-me oprimido/a, esmagado/a e/ou subjugado/a por certa/as pessoas. ____
7. Nunca tive e nunca tenho o carinho, afeto e amor que necessito nas minhas relações. ____
8. Critico-me pelas coisas que penso, sinto e faço. ____
9. Sou desconfiando quando às intenções dos outros. ____
10. Reajo com explosões de raiva quando me sinto ofendido/a e/ou atacado/a. ____
11. Sinto-me vazio e sem vida. ____
12. Evito situações e/ou pessoas que considero ameaçadoras. ____
13. Se não concordar com os outros sofrerei as consequências (rejeição, crítica, julgamento). ____
14. Sinto medo, vergonha e/ou irritação quando não consigo ser perfeito. ____
15. Necessito de uma pessoa forte, segura e capaz para me proteger e cuidar de mim. ____
16. Procuro ignorar as minhas emoções quando elas se tornam insuportáveis. ____
17. Sou superior às outras pessoas. ____

1

Escala de Regulação da Satisfação das Necessidades
(ERSN-43)

Seguidamente apresentamos uma sequência de afirmações relativas a características e vivências pessoais. Por favor, leia com atenção cada uma delas e responda, assinalando o seu grau de acordo ou desacordo numa escala de 1 a 8. **O número "1" significa que "discorda totalmente" e o "8" que "concorda totalmente".** A linha divisória entre o "4" e o "5" separa as zonas de desacordo e de acordo. Quanto mais elevado for o número seleccionado maior é o grau de acordo.

1 a 4 Desacordo				5 a 8 Concordo			
1	2	3	4	5	6	7	8

Dados Pessoais

Nome:_____

Sexo: M □ | F □   Data de Nascimento:_____/_____/_____

Estado Civil:_____

Data de Realização:_____/_____/_____

Instruções:

Em baixo, encontrará uma lista de afirmações. Por favor, classifique o quanto é verdadeira para si cada afirmação, rodeando para esse efeito um dos números que se encontra em frente a cada frase. Responda, por favor, a cada frase, usando a seguinte escala.

Nunca verdadeiro	Muito raramente verdadeiro	Raramente verdadeiro	Às vezes verdadeiro	Frequentemente verdadeiro	Quase sempre verdadeiro	Sempre verdadeiro
1	2	3	4	5	6	7

1. Os meus pensamentos perturbam-me ou causam-me sofrimento emocional.	1	2	3	4	5	6	7
2. Eu devo evitar situações desagradáveis de qualquer maneira.	1	2	3	4	5	6	7
3. Analiso em excesso as situações até ao ponto em que isso já não é útil para mim.	1	2	3	4	5	6	7
4. Vivo numa luta com os meus pensamentos.	1	2	3	4	5	6	7
5. Fico chateado/a comigo mesmo/a por ter certos pensamentos.	1	2	3	4	5	6	7
6. Tendo a deixar-me enredar ("prender") pelos meus pensamentos.	1	2	3	4	5	6	7
7. Sinto muita dificuldade em "largar" os meus pensamentos perturbadores, mesmo quando sei que seria mais vantajoso fazê-lo.	1	2	3	4	5	6	7

ESCALA DE DIFICULDADES DE PROCESSAMENTO EMOCIONAL - Revista

Barreira & Vasco (2015)

(Revista por B. Faustino, A. B. Vasco & A. N. Silva, 2018)

Nome: _____ Género:_____ Idade:_____

Data:_____ Grau de Escolaridade:_____ Profissão:_____

Instruções: Instruções: Por favor indique com que frequência vivencia as experiências mencionadas nas seguintes afirmações. Com base na seguinte escala de 1 a 5, por favor, selecione, à frente de cada afirmação, o valor que melhor corresponde à sua experiência. É importante que responda a todos os itens. Obrigado!

Escala de Resposta				
1	2	3	4	5
Nunca	Raramente	Às vezes	Frequentemente	Sempre

1	Quando me sinto zangado bloqueio essa emoção.	1	2	3	4	5
2	Sinto um aperto no peito que não consigo perceber.	1	2	3	4	5
3	Sinto uma tensão no corpo que não consigo explicar/perceber	1	2	3	4	5
4	Sinto-me frágil.	1	2	3	4	5
5	Fico confuso com as minhas reações.	1	2	3	4	5
6	Sinto um "aperto no estômago" que não consigo perceber.	1	2	3	4	5
7	Sinto vergonha de mim próprio(a)	1	2	3	4	5
8	Critico-me pelas coisas que faço.	1	2	3	4	5
9	Critico-me pelo que sinto.	1	2	3	4	5
10	Sinto mágoa face a pessoas importantes que fazem ou fizeram parte da minha vida	1	2	3	4	5
11	Dou por mim a criticar-me.	1	2	3	4	5
12	Fico surpreendido(a) com os meus comportamentos relativamente a determinados acontecimentos/acontecimento específicos.	1	2	3	4	5
13	Sinto um "aperto na garganta" que não consigo compreender.	1	2	3	4	5
14	Quando sinto medo bloqueio essa emoção.	1	2	3	4	5
15	Fico surpreendido(a) com as minhas reações emocionais a acontecimentos específicos.	1	2	3	4	5
16	Quando me sinto triste bloqueio essa emoção.	1	2	3	4	5

1

Inventário de Problemas Interpessoais (IIP – 32)

Barkham, Hardy, and Startup (1996)

(Traduzido e adaptado por Faustino, B e Vasco. A. B, 2020)

As pessoas por vezes referem problemas nos relacionamentos com os outros. Por favor, leia a seguinte lista de frases e considere se alguma delas representa um problema entre si ou a alguma pessoa significativa na sua vida. De seguida, escolha o número que descreve a forma como esse problema tem sido perturbador para si e faça um círculo à volta desse número.

	PARTE 1: A lista que se segue diz respeito aos aspetos que considera difíceis fazer com as outras pessoas.					
	É difícil para mim:	De forma alguma	Um Pouco	Moderadamente	Bastante	Extremamente
1	Juntar-me em grupo.	0	1	2	3	4
2	Ser assertivo/a com as outras pessoas.	0	1	2	3	4
3	Fazer amigos.					
4	Comprometer-me a longo prazo com outra pessoa.	0	1	2	3	4
5	Ser agressivo/a com uma pessoa quando a situação o exige.	0	1	2	3	4
6	Manter uma relação de trabalho com alguém que eu não gosto.	0	1	2	3	4
7	Socializar com as outras pessoas.	0	1	2	3	4
8	Mostrar afeto pelos outros.	0	1	2	3	4
9	Sentir-me confortável ao pé de outras pessoas.	0	1	2	3	4
10	Contar assuntos pessoais às outras pessoas.	0	1	2	3	4
11	Ser firme quando preciso de o ser.	0	1	2	3	4
12	Experienciar um sentimento de amor por outra pessoa.	0	1	2	3	4
13	Ser apoiante relativamente aos objetivos de vida de outra pessoa.	0	1	2	3	4
14	Preocupar-me realmente com os problemas dos outros.	0	1	2	3	4
15	Pôr as necessidades dos outros à frente das minhas.	0	1	2	3	4
16	Receber instruções de pessoas que têm autoridade sobre mim.	0	1	2	3	4
17	Abrir-me e falar dos meus sentimentos às outras pessoas.	0	1	2	3	4
18	Preocupar-me com o meu bem-estar quando outra pessoa está necessitada.	0	1	2	3	4
19	Estar envolvido com outra pessoa sem me sentir preso.	0	1	2	3	4

Inventário de Sintomas Psicopatológicos
(BSI)

Segue-se uma lista de problemas ou sintomas que, por vezes, as pessoas apresentam. Por favor, assinale aquele que melhor descreve o grau em que cada problema ou sintoma o/a incomodou durante a última semana.

EM QUE MEDIDA FICOU PERTURBADO/A POR:	Nada	Poucas vezes	Algumas vezes	Muitas vezes	Muitíssimas vezes
1. Nervosismo ou tensão interior.	0	1	2	3	4
2. Desmaios ou tonturas.	0	1	2	3	4
3. Ter a impressão que as outras pessoas podem controlar os meus pensamentos.	0	1	2	3	4
4. Ter a ideia que os outros são culpados pela maioria dos seus problemas.	0	1	2	3	4
5. Dificuldade em se lembrar de coisas passadas ou recentes.	0	1	2	3	4
6. Aborrecer-se ou irritar-se facilmente.	0	1	2	3	4
7. Dores sobre o coração ou no peito.	0	1	2	3	4
8. Medo na rua ou praças públicas.	0	1	2	3	4
9. Pensamentos de acabar com a vida.	0	1	2	3	4
10. Sentir que não pode confiar na maioria das pessoas.	0	1	2	3	4
11. Perder o apetite.	0	1	2	3	4
12. Ter um medo súbito sem razão para isso.	0	1	2	3	4
13. Ter impulsos que não se podem controlar.	0	1	2	3	4
14. Sentir-se sozinho/a mesmo quando está com mais pessoas.	0	1	2	3	4
15. Dificuldade em fazer qualquer trabalho.	0	1	2	3	4
16. Sentir-se sozinho/a.	0	1	2	3	4

QUESTIONARIO DE ESTILOS PARENTAIS

Desenvolvido por Jeffrey Young

(Traduzido e adaptado por M. C. Salvador, D. Rijo e J. Pinto Gouveia, 1996, 2003)

CINEICC - Centro de Investigação do Núcleo de Estudos e Intervenção Cognitivo-Comportamental; Universidade de Coiml

Nome_____ Data _____

INSTRUÇÕES: Estão indicadas a seguir algumas afirmações que pode utilizar para descrev seus pais. Por favor, leia cada uma das afirmações e decida até que ponto ela os descreve. Escolh entre as seis respostas possíveis, aquela que melhor descreve a sua mãe e o seu pai, **quando voc criança**, colocando o respectivo número no espaço em branco. Caso um dos seus pais tenha substituído por outra pessoa, responda tendo em conta essa pessoa. Se não teve pai ou mãe, de coluna correspondente em branco.

ESCALA DE RESPOSTA

1 = Completamente falso / Não tem absolutamente nada a ver com o que acontecia comigo

2 = Falso na maioria das vezes / Não tem quase nada a ver com o que acontecia comigo

3 = Ligeiramente mais verdadeiro do que falso / Tem ligeiramente a ver com o que acontecia comig

4 = Moderadamente verdadeiro / Tem moderadamente a ver com o que acontecia comigo

5 = Verdadeiro a maioria das vezes / Tem muito a ver com o que acontecia comigo

6 = Descreve-a(o) perfeitamente / Tem tudo a ver com o que acontecia comigo

MÃE	PAI	DESCRIÇÃO
_____	_____	1. Gostava de mim e tratava-me como uma pessoa especial.
_____	_____	2. Prestava-me atenção, passando bastante tempo comigo.
_____	_____	3. Dava-me conselhos e orientações úteis.
_____	_____	4. Ouvia-me, compreendia-me e partilhava sentimentos comigo.
_____	_____	5. Era calorosa(o) e fisicamente afectuosa(o). *pe
_____	_____	6. Morreu ou abandonou a casa permanentemente quando eu era criança.
_____	_____	7. Tinha mau humor, era imprevisível ou era alcoólica(o).
_____	_____	8. Preferia os meus irmãos a mim.
_____	_____	9. Isolava-se ou deixava-me sozinho(a) por longos períodos de tempo *ab
_____	_____	10. Mentia-me, enganava-me ou traía-me.

Encontra abaixo um conjunto de afirmações sobre a sua infância. Por favor classifique-as de acordo com o que viveu nessa fase da sua vida

	Na minha infância e juventude...	Nunca	Poucas vezes	Às vezes	Muitas vezes	Sempre
1	Eu não tinha comida suficiente.	☐	☐	☐	☐	☐
2	Sabia que havia alguém para me cuidar e proteger.	☐	☐	☐	☐	☐
3	As pessoas da minha família chamavam-me nomes (estúpido(a), preguiçoso(a), feio(a), etc.).	☐	☐	☐	☐	☐
4	Os meus pais não conseguiam cuidar da família porque se embriagavam ou drogavam.	☐	☐	☐	☐	☐
5	Havia alguém na minha família que me ajudava a sentir especial ou importante	☐	☐	☐	☐	☐
6	Tinha que usar roupas sujas.	☐	☐	☐	☐	☐
7	Senti-me amado(a).	☐	☐	☐	☐	☐
8	Achava que os meus pais preferiam que eu nunca tivesse nascido.	☐	☐	☐	☐	☐
9	Na minha família batiam-me tanto que tinha que ir ao hospital ou ao médico.	☐	☐	☐	☐	☐
10	A minha família parecia quase perfeita.	☐	☐	☐	☐	☐
11	Na minha família batiam-me tanto que me deixavam pisado ou com nódoas negras no corpo.	☐	☐	☐	☐	☐
12	Batiam-me com um cinto, um pau, uma corda ou outras coisas que me magoavam.	☐	☐	☐	☐	☐
13	As pessoas da minha família cuidavam umas das outras.	☐	☐	☐	☐	☐

ESCALA DE AUTOAVALIAÇÃO METACOGNITIVA

Pedone, Semerari, Riccardi, Procacci, Nicolò e Carcione, (2019)

(Tradução e adaptação por B. Faustino, S. Seromenho, P. Lopes, J. Oliveira e I. Fonseca, 2017)

Nome: _____ Género:_____ Idade:_____

Data:_____ Grau de Escolaridade:_____ Profissão:_____

Instruções: O questionário considera o que as pessoas pensam sobre a sua capacidade de identificar e descrever seus pensamentos, emoções e as relações sociais nas quais estão envolvidos. Por favor, leia cuidadosamente cada afirmação e indique segundo o seu julgamento em que medida é que se aplicam a si. Para responder use a escala que se encontra em baixo e coloque um círculo na caixa respetiva. Obrigado pela sua cooperação!

Escala de Resposta				
1	2	3	4	5
Nunca	Raramente	Às vezes	Frequentemente	Sempre

Nº	Relativamente a mim, normalmente…	1	2	3	4	5
1	Consigo distinguir e diferenciar as minhas capacidades mentais (recordar, imaginar, ter fantasias, possuir desejos, tomar decisões, raciocinar e pensar sobre o futuro).	1	2	3	4	5
2	Consigo definir, distinguir e nomear as minhas emoções.	1	2	3	4	5
3	Estou consciente de quais são os meus pensamentos e/ou emoções que me levam a agir.	1	2	3	4	5
4	Estou consciente de que o que penso de mim é uma ideia e não necessariamente verdade. Eu percebo que as minhas opiniões podem não ser corretas e que podem mudar.	1	2	3	4	5
5	Estou consciente de que o que desejo ou o que espero pode não se realizar e que eu tenho um poder limitado para influenciar as coisas.	1	2	3	4	5
6	Posso claramente perceber e descrever os meus pensamentos, emoções e relacionamentos em que estou envolvido.	1	2	3	4	5
7	Posso descrever o assunto que liga os meus pensamentos e as minhas emoções, mesmo quando diferem de um momento para outro.	1	2	3	4	5

Questionário de Esquemas Emocionais de Leahy

(Silva, Matos, Faustino & Neto, 2018)

Estamos interessados em saber como lida com as suas emoções ou sentimentos – por exemplo, como lida com emoções como zanga, tristeza, e ansiedade ou sentimentos sexuais. Somos todos diferentes na forma como lidamos com estes sentimentos, pelo que não existem respostas certas ou erradas. Por favor, leia cada uma das seguintes frases cuidadosamente e posicione-se, usando a seguinte escala, relativamente a **como lidou com os seus sentimentos** <u>no último mês</u>. Escreva o número que melhor se aplica a si em frente à frase:

1 = Nada verdadeiro
2 = Ligeiramente verdadeiro
3 = Um pouco verdadeiro
4 = Moderadamente verdadeiro
5 = Bastante verdadeiro
6 = Extremamente verdadeiro

1. Quando me sinto em baixo, tento pensar numa forma diferente de ver as coisas. ____

2. Quando um sentimento me incomoda, tento pensar porque é que o mesmo não é importante. ____

3. Frequentemente penso que reajo com sentimentos que os outros não teriam. ____

4. Há sentimentos que não deveríamos sentir. ____

5. Há coisas sobre mim que simplesmente não compreendo. ____

6. Acredito que é importante permitir-me chorar de forma a libertar os meus sentimentos. ____

7. Se me permitir ter alguns destes sentimentos, temo perder o controlo. ____

8. Os outros compreendem e aceitam os meus sentimentos. ____

9. Não te podes permitir ter certo tipo de sentimentos, como sentimentos sobre sexo ou violência. ____

10. Os meus sentimentos não me fazem sentido. ____

11. Se os outros mudassem, sentir-me-ia muito melhor. ____

12. Acho que tenho sentimentos dos quais não tenho consciência. ____

13. Por vezes receio que se me permitir ter um sentimento intenso, ele não desaparecerá. ____

14. Sinto vergonha dos meus sentimentos. ____

15. Coisas que incomodam os outros não me incomodam a mim. ____

16. Ninguém se preocupa verdadeiramente com os meus sentimentos. ____

17. É importante para mim ser razoável e prático, em vez de sensível e aberto aos meus sentimentos. ____

18. Não suporto ter sentimentos contraditórios – como gostar e não gostar da mesma pessoa. ____

19. Sou muito mais sensível que as outras pessoas. ____

20. Tento livrar-me de sentimentos desagradáveis assim que ocorrem. ____

TEMPS-A

COMO RESPONDER ÀS AFIRMAÇÕES

Faça um círculo à roda do V (Verdadeiro) em todas as afirmações que são verdadeiras para si em relação **à maior parte da sua vida**.
Faça um círculo à roda do F (Falso) para todas as restantes afirmações que não se aplicam a si em relação **à maior parte da sua vida.**

0. V F Sou uma pessoa que respira.

Use um lápis ou caneta e responda a cada afirmação depois de a ler.

1. V F A minha capacidade de pensar varia muito entre a rapidez e a lentidão sem razão aparente.
2. V F Vario constantemente entre a vivacidade e a moleza.
3. V F Tenho mudanças bruscas de disposição e energia.
4. V F Vivo as coisas, algumas vezes, de forma intensa e outras vezes amorfa.
5. V F A minha disposição muda frequentemente sem razão
6. V F Oscilo entre o desejo de estar com os outros e o de me afastar deles.
7. V F A minha disposição e energia estão frequentemente muito elevadas ou muito em baixo, raramente a meio termo.
8. V F Oscilo entre o excesso de confiança e a insegurança de mim próprio.
9. V F A minha necessidade de dormir varia muito, entre poucas horas a mais de 9 horas.
10. V F Por vezes deito-me sentindo-me formidável e acordo na manhã seguinte com o sentimento de que a vida não merece a pena ser vivida.
11. V F Posso gostar realmente muito de alguém e depois perder completamente o interesse.
12. V F Sou o tipo de pessoa que pode estar triste e feliz ao mesmo tempo.
13. V F As pessoas dizem- me que sou incapaz de ver o lado mais positivo das coisas.
14. V F Sou o tipo de pessoa que duvida de tudo.
15. V F Sou uma pessoa muito céptica.
16. V F Sou, por natureza, uma pessoa insatisfeita.
17. V F Sou uma pessoa triste, infeliz.

Appendix C – Protocol of neuropsychological assessment instrument

Teste Stroop Neuropsicológico em Português

São Luís Castro, Luís S. Cunha e Luísa Martins

Sinopse, Folha de Registo e Cotação do Teste Stroop Neuropsicológico em Português. Disponibilizamos este teste a profissionais interessados, para fins de investigação e/ou clínicos.

WMS®-III

Escala de Memória de Wechsler — Terceira Edição

Caderno de Registo

FLUENCIA VERBAL SEMÁNTICA

Quero que me diga o mais rápido que possa, palavras que pertençem ao que eu vou dizer Por exemplo, se eu dizer transportes, posse dizer carro, avião, barco,.... ¿Alguna pergunta?. Muito bem, dígame....

1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.
7.	7.	7.
8.	8.	8.
9.	9.	9.
10.	10.	10.
11.	11.	11.
12.	12.	12.
13.	13.	13.
14.	14.	14.
15.	15.	15.
16.	16.	16.
17.	17.	17.

Seqüência de Categorias: C F N C F N

_____	1.C F N O	_____	33.C F N O	_____	1.C F N O	_____	33.C F N O
_____	2.C F N O	_____	34.C F N O	_____	2.C F N O	_____	34.C F N O
_____	3.C F N O	_____	35.C F N O	_____	3.C F N O	_____	35.C F N O
_____	4.C F N O	_____	36.C F N O	_____	4.C F N O	_____	36.C F N O
_____	5.C F N O	_____	37.C F N O	_____	5.C F N O	_____	37.C F N O
_____	6.C F N O	_____	38.C F N O	_____	6.C F N O	_____	38.C F N O
_____	7.C F N O	_____	39.C F N O	_____	7.C F N O	_____	39.C F N O
_____	8.C F N O	_____	40.C F N O	_____	8.C F N O	_____	40.C F N O
_____	9.C F N O	_____	41.C F N O	_____	9.C F N O	_____	41.C F N O
_____	10.C F N O	_____	42.C F N O	_____	10.C F N O	_____	42.C F N O
_____	11.C F N O	_____	43.C F N O	_____	11.C F N O	_____	43.C F N O
_____	12.C F N O	_____	44.C F N O	_____	12.C F N O	_____	44.C F N O
_____	13.C F N O	_____	45.C F N O	_____	13.C F N O	_____	45.C F N O
_____	14.C F N O	_____	46.C F N O	_____	14.C F N O	_____	46.C F N O
_____	15.C F N O	_____	47.C F N O	_____	15.C F N O	_____	47.C F N O
_____	16.C F N O	_____	48.C F N O	_____	15.C F N O	_____	48.C F N O

REY

Teste de Cópia de Figuras Complexas

Folha de Registo

Figura A

Nome: _____ Idade: _____ Sexo: _____

Local: _____ Data: _____

CRITÉRIOS DE PONTUAÇÃO		
PONTUAÇÃO	**EXACTIDÃO**	**LOCALIZAÇÃO**
2	Correcta	Bem
1	Correcta	Mal
1	Deformada ou incomplecta, reconhecível	Bem
0,5	Deformada ou incomplecta, reconhecível	Mal
0	Irreconhecível ou ausente	Mal

Elementos	CÓPIA	MEMÓRIA
1. Cruz exterior, ângulo superior esquerdo do rectângulo grande		
2. Rectângulo grande, armação da figura		
3. Cruz de Santo André, diagonais do rectângulo grande		
4. Mediana horizontal do rectângulo grande 2		

Perfil das Pontuações Transformadas

PC	CÓPIA	MEMÓRIA	PC

569