

University of Mississippi

eGrove

---

Electronic Theses and Dissertations

Graduate School

---

8-1-2022

## Testing emotion regulation as a functional transdiagnostic construct

Enoch Sackey

Follow this and additional works at: <https://egrove.olemiss.edu/etd>

---

### Recommended Citation

Sackey, Enoch, "Testing emotion regulation as a functional transdiagnostic construct" (2022). *Electronic Theses and Dissertations*. 2399.

<https://egrove.olemiss.edu/etd/2399>

This Dissertation is brought to you for free and open access by the Graduate School at eGrove. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of eGrove. For more information, please contact [egrove@olemiss.edu](mailto:egrove@olemiss.edu).

TESTING EMOTION REGULATION AS A FUNCTIONAL TRANSDIAGNOSTIC  
CONSTRUCT IN PSYCHOPATHOLOGY SYMPTOMS

A Dissertation

presented in partial fulfillment of requirements

for the degree of Doctor of Philosophy

in Clinical Psychology

The University of Mississippi

Enoch Tawiah Sackey

August, 2022

Copyright © 2022 by Enoch T. Sackey

ALL RIGHTS RESERVED

## ABSTRACT

The polythetic criteria of the DSM and ICD generate high amount of symptom heterogeneity as there are clusters of symptoms within various diagnostic category that are heuristically similar, resulting in multiple, often confusing, ways of describing sequelae of symptoms presentation. This is because the DSM and ICD classification systems were developed based on the neo-Kraepelinian framework for classifying physical illnesses, which assumes that the underlying architecture of psychopathology, which manifest in disorder symptoms, are distinct and specific. Based on this, the categorical approach to describing psychopathology has been described as purely conceptual artefact with no empirical basis in research or practice. Studies indicate that conceptualizing disorders based on their underlying etiology would yield more valuable information, by highlighting the functional liabilities that portend risks for disorder symptom presentation. As a result, various transdiagnostic models of psychopathology have been proposed to explain the underlying mechanism of disorder symptoms.

However, existing transdiagnostic models of psychopathology are mostly atheoretical, as there is absence of a well-grounded conceptual formulation backing their fundamental assumptions. This has resulted in an explanatory vacuum regarding the structure of psychopathology etiology, frequent symptom heterogeneity within disorders, and non-specificity of disorder symptoms. Current study sought to explore these limitations by testing emotion regulation difficulties as a functional transdiagnostic construct that underlie symptoms of anxiety- and mood-related disorders, using factor-mixture modeling.

The results of the study indicated that the best fitting model of the structure of emotion regulation difficulties is a hybrid model, consisting of two categories and six factors. The class status differentially predicted experiences of anxiety- and mood-related disorders, even after controlling for education, age, and adverse life events. The dimensions of emotion regulation difficulties suggested that variations in the severity of psychopathology symptoms within the classes occurred based on six distinct factors, resulting in heterogeneity of symptoms within classes and comorbidity among symptoms of different disorders. Overall, the study results provide support for emotion regulation difficulties as a functional transdiagnostic construct across symptoms of psychopathology.

## ACKNOWLEDGEMENTS

I am immensely grateful to Drs. Danielle Maack and John Young for making graduate school and internship happen for me - literally. No amount of words can convey how thankful I am to you!

Thank you to Drs. John Bentley and Mervin Mathew for accepting to sit on my dissertation committee. I am very appreciative of your thoughtful questions and suggestions that have shaped this work to be as methodologically and statistically rigorous as it could be.

Thank you to everyone who has supported me in diverse ways.

## TABLE OF CONTENTS

ABSTRACT .....	ii
ACKNOWLEDGMENT .....	iv
LIST OF TABLES .....	vi
LIST OF FIGURES .....	viii
CHAPTER 1: INTRODUCTION .....	1
CHAPTER 2: METHOD .....	30
CHAPTER 3: RESULTS .....	38
CHAPTER 4: DISCUSSION .....	58
LIST OF REFERENCES .....	75
LIST OF APPENDICES .....	108
CURRICULUM VITA .....	169

## LIST OF TABLES

1. Overall sample demographic characteristics (N = 1570) .....	135
2. KMO and Bartlett's test.....	136
3. Fit indices of the factors .....	137
4. Eigenvalues and percentage of total variance explained by the six factors .....	138
5. The factor structure of DERS.....	139
6. Correlations among the factors.....	140
7. Random starts values.....	141
8. Class enumeration results for the latent profile analysis.....	142
9. Class counts and proportions for latent classes.....	143
10. Classification posterior probabilities.....	144
11. The global solution of the random starts results values .....	145
12. Fit indices for the enumerated factor mixture models .....	146
13. Probability for the most likely class membership for 2 class, 6 factor FMM.....	147
14. Class counts for 2 class, 6 factor FMM .....	148
15. Model Comparison of FA, LPA and FMM.....	149
16. Model variations: 2-Class, 6-Factor FMM.....	150
17. Class counts for FMM-1 2 class, 6 factors .....	151
18. Probability for the most likely class membership for the FMM-1 2-Class, 6 Factors.....	152
19. Mean differences between the classes on psychopathology vulnerability .....	153
20. Correlations between the (within-class) factors and psychopathology vulnerabilities ...	154



21. Measurement invariance: sex groups.....	155
22. Measurement invariance: age groups .....	156
23. Measurement invariance: ethnic groups.....	157
24. Effects of covariates emotion regulation class membership.....	158
25. Odd ratios for the effects of covariates on emotion regulation class membership.....	159
26. Between class differences on the levels of emotion regulation difficulties.....	160
27. Between-class differences on (continuous) symptoms of psychopathology.....	161
28. Differentiation of psychopathology symptoms based on the dimensions DERS.....	162
29. Prediction of the level of depression symptoms by the category of DERS class .....	163
30. Prediction of borderline personality disorder symptoms by the category of DER class.	164
31. Prediction of the level of anxiety symptoms by the category of DERS class.....	165

## LIST OF FIGURES

1. The factor structure of emotion regulation difficulties .....166
2. Profile of emotion regulation difficulties .....167
3. Profile of the 2 class, 6 factor FMM model of emotion regulation difficulties .....168

## CHAPTER 1

### INTRODUCTION

This study explored emotion regulation difficulties as a functional transdiagnostic construct in psychopathology symptoms. Studies have identified involvement of emotion regulation difficulties in the onset, course, and maintenance of psychiatric disorders (Eaton, Rodriguez-Seijas, Carragher, & Krueger, 2015; Fernandez, Jazaieri, & Gross, 2016; Sloan et al., 2017). For example, emotion regulation difficulties have been indicated in the symptoms associated with anxiety- and mood-related disorders (Aldao, 2012; Kring & Sloan, 2009), borderline personality disorder (Gunderson, Gratz, Neuhaut, & Smith, 2005; Wagner & Linehan, 1999), schizophrenia spectrum disorders (Khoury & Lecomte, 2012), psychotic disorders (Livingstone, Harper, & Gillanders, 2009), personality disorders (Schoenleber & Berenbaum, 2012), substance use-related disorders (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Kober, 2014), and autism spectrum disorders (Cai, Richdale, Uljarević, Dissanayake, & Samson, 2018). The generalized contribution of emotion regulation difficulties in the symptoms of these disorders point to evidence that emotion regulation difficulties could function as a common factor that underlie the onset and maintenance of these disorders.

The introduction discusses the meaning of emotion regulation and nature of emotion regulation difficulties in psychopathology symptoms, transdiagnostic models of psychopathology, examples of transdiagnostic models of psychopathology, and research considerations in the transdiagnostic models of psychopathology.

## **Meaning of Emotion Regulation and Nature of Emotion Regulation Difficulties in Psychopathology Symptoms**

Emotion regulation refers to the process by which individuals alter their emotional responses, consciously or unconsciously (Rottenberg & Gross, 2003), to meet environmental demands (Gratz & Roemer, 2004; Gross, 1998a). The process of altering emotional responses occurs when encountering a situation in which an emotional response is triggered and a change (or regulation) is required for proper adaptation, interpretation, and successful goal attainment (Gross & Jazaieri, 2014). Thus, emotion regulation involves the initiation of a goal that influences the process of emotion generation that results in subjective alteration in experiential, physiological, and behavioral responses (Gross & Feldman Barrett, 2011; Gross & Jazaieri, 2014; Mauss, Bunge, & Gross, 2007), which are characterized by differing variations in their intensity, frequency, and duration (Reeck, Ames, & Ochsner, 2016). However, disruptions can occur in the emotion generation process, resulting in problematic emotional responses that result in emotion-regulation failure and /or emotion mis-regulation (Gross, 2013, 2015b; Sheppes, Suri, & Gross, 2015; Suri, Sheppes, & Gross, 2015).

Emotion regulation failure occurs when there is disengagement in emotional responses in the presence of emotionally-relevant situation, including the failure to act in a specific way when it would be beneficial to do so (Sheppes et al., 2015). On the other hand, emotion mis-regulation occurs when there is a mismatch between the type, intensity or duration of the emotional responses applied and the emotionally relevant situation (Sheppes et al., 2015). An example of emotion mis-regulation includes frequent application of regulation strategies such as thought suppression, use of substances, and or binge eating as a way of numbing distressing physiological arousals resulting from confrontational encounters, including conflicts with loved

ones (Gross, 2013; Wenzlaff & Wegner, 2000). Emotion regulation failure and emotion misregulation have been linked to the onset and maintenance of psychopathology symptoms by the extended process model of emotion regulation (Gross, 2015a; Sheppes et al., 2015; Suri et al., 2015).

The extended process model refers to the mechanisms by which people regulate their emotions via iterative loops in order to respond to the various demands posed by the environment (Gross, 2015), and problems occur when there are disruptions in the valuation system that is linked to the various stages of emotion regulation process (Sheppes et al., 2015). According to the extended process model, emotion regulation takes place through a four-stage process: identification of the type of emotion to be regulated; selection of a strategy to regulate the emotion; implementation of the strategy selected; and monitoring of the implemented strategy to evaluate its effectiveness (Sheppes et al., 2015). These stages are differentiated by primary subjective goals or values, indicating subjective values (value processing) individuals ascribe to the emotion-eliciting events/situations to determine whether or not emotional response is required (Ochsner & Gross, 2014; Rangel, Camerer, & Montague, 2008). And these subjective values are processed through a Valuation system of emotion regulation (Sheppes et al., 2015).

The Valuation system constitutes the systems via which emotion regulation operates to activate goals for emotional responding (Gross & Feldman Barrett, 2011), and it is activated when there is a triggering of an event that needs to be perceived, valued, and acted upon (Ochsner & Gross, 2014). The Valuation system is constituted by four phases of emotional processing, which are the World (W), Perception (P), Valuation (V), and Actions (A) (Ochsner & Gross, 2014). The “W” represents the aspect of the World, internal or external, where emotion-eliciting events are triggered. The “P” represents Perception, which indicates selective

attention mechanism for discriminating relevant emotional situations. The “V” refers to Value, denoting the appraisal mechanism for estimating the benefits and costs associated with emotional responding. The “A” references Action, which is the actual response or action carried out that translates into tangible outcomes of emotional responding (Sheppes, et al., 2015). The Valuation system operates in a series of World-Perception-Valuation-Action (W-PVA) cycles (Sheppes et al., 2015), depending on the difference between current emotional states and desired goals in the emotion-arousing situation. The Valuation system estimates the weight of discrepancy in each of the four stages and stays active as long as the discrepancy between the current and desired emotional states remains at the optimum threshold (Ochsner & Gross, 2014). However, significant differences between current emotional states and desired goals leads to disruptions in the perception, valuation, and action phases of the Valuation system resulting in emotion regulation difficulties (Sheppes, et al., 2015).

Thus, the Valuation system of the extended process model allows for exploration of the relationship between emotion regulation difficulties and psychopathology symptoms by specifying the difficulties that occur at each stage in the regulatory process, and how they contribute to the development and/or maintenance of disorder symptoms (Fernandez et al., 2016; Sheppes et al., 2015). The specific emotion regulation difficulties that occur in the Valuation system are difficulties with identification, difficulties with strategy selection, difficulties with implementation, and difficulties with monitoring of emotional responses (Sheppes et al., 2015).

### **Difficulties with identification**

Difficulties with identification occur when there are problems in generating emotional responses due to difficulties with perception, valuation, and action in the Valuation system. First,

difficulties with perception occur when there are representational problems in emotional responses, leading to misrepresentation of current emotional response and desired emotional states (Sheppes, et al., 2015). These problems are reflected in overrepresentation or underrepresentation of emotionally-relevant events or situations, including overrepresentation of cognitive or bodily signs of current emotional state, resulting in attentional disengagement biases (Association, 2013; McNally, 2002; Olatunji, Cisler, & Tolin, 2007). For example, unexpected and recurrent panic attacks occurring as a result of misrepresentation of benign physiological experiences such as racing heart, shortness of breath and hot flushes. On the other hand, underrepresentation of emotion eliciting stimuli leads to reduction in the activation of the neutral networks, resulting in reduced emotional attention and recognition, as seen, for example, in the occurrence and maintenance of alexithymia (van der Velde et al., 2015; van der Velde et al., 2014).

Second, difficulties with valuation occurs when there is misappraisal of the cost and benefits associated with maintaining current emotional state versus regulating an emotion to achieve a desired state (Sheppes et al., 2015). Misappraisal of goals for emotional responding results in either over-valuation or undervaluation of the cost associated with current emotional state (Sheppes et al., 2015). Over-valuation of the current emotional state occurs when there is an overestimation of negative emotions associated with stimulus events, leading to an escape from the emotional responding by engaging in behaviors such as experiential avoidance (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Kashdan, Barrios, Forsyth, & Steger, 2006). For example, overly valuing the costs of an uncomfortable memory leads to application of thought suppression as a means of escaping from the uncomfortable feelings, as usually seen in experiential avoidance associated with social anxiety (Hayes et al., 2004). On the other hand,

under-valuation of affective responses results in underestimation of current emotional state, leading to the tendency to persist in emotionally arousing experiences that, for example, occurs in substance use problems (Sheppes et al., 2015). This form of emotional response is also indicated in borderline personality and dependent personality characteristics, with clinging profiles that require excessive need from others (Livesley, Jackson, & Schroeder, 1992).

Finally, difficulties with action involve problems in translating sufficient levels of negative or positive emotional state into action or output response (Sheppes et al., 2015). This is seen, for example, in learned helplessness associated with major depressive disorder (Abramson, Metalsky, & Alloy, 1989), where an individual stops learning and applying adaptive techniques, such as adaptive information processing and cognitive restructuring that are helpful for dealing with frequent feelings of guilt and thought suppression after initial unsuccessful attempts. Overall, difficulties with identifying appropriate emotional responses due to difficulties in emotion perception, valuation of emotional response, and initiation of action to generate emotion result in over- and under-representation of emotion stimulus, misappraisal of emotional states, and learned helplessness that underlie psychopathology symptoms which are associated with mood- and anxiety-related disorders.

### **Difficulties with Strategy Selection**

At the strategy selection stage, the Valuation system determines the type of approach to use to respond to the identified emotional event based on the goals set earlier at the identification stage (Sheppes, et al., 2015). At this stage problems occur when there are difficulties in strategy perception, valuation, and action.

First, difficulties in strategy perception involve a misrepresentation of available emotion regulation strategies, leading to underrepresentation of available options to be selected (Sheppes



et al., 2015). Underrepresentation of available strategies results in attentional narrowing which maximizes the proximal value of existing aversive states (Watkins, 2011). The problem of strategy perception has been indicated in issues relating to suicide and binge eating, where the limited representation of regulatory options and intolerable self-awareness maximizes the proximal value for escape through maladaptive means (Heatherton & Baumeister, 1991; Watkins, 2011).

Second, difficulties with valuation occur when there is inaccurate evaluation of cost and benefits associated with the strategies available (Sheppes et al., 2015). This problem has been identified in self-harm and substance-use related disorders (Nock, 2010). For example, Nock & Banaji (2007) indicated that people who engage in self-harm tend to associate positive value with it, by using self-harm as a way of identifying with their pain or suffering (Nock & Banaji, 2007). Also, individuals who use substances attribute high positive value to the anticipated reduction in negative emotions (Kober, 2014). In this way, inaccurate evaluation of cost and benefit is used as an effective way of altering distressing emotions (McKenzie & Gross, 2014).

Finally, difficulties with action occurs when there is malfunction in executing the selected strategy for regulation due to general impairments in the ability for adopting appropriate tactics or executing alternative perspectives to carry out the adaptive emotional response (Gross, 2014; Sheppes et al., 2015). These difficulties have been observed in autism spectrum disorders, in which individuals exhibit relative difficulties in activating alternative options or reappraising existing strategies, even with assistance, in responding to emotion-related stimuli (Samson, Huber, & Gross, 2012). Additionally, it is evidenced in frequent misappraisal of social situations that is prevalent in social anxiety and misappraisal of self-harm behaviors in borderline personality disorders (Aldao, 2012; Linehan & Kehrer, 1993). Generally, difficulties with

strategy selection occurs when there is misappraisal and underrepresentation of available strategies, inaccurate evaluation of values associated available strategies, and lack of belief in personal ability to execute adaptive strategies available, leading to attentional narrowing, distorted attribution of positive value to self-harm, and poor self-efficacy.

### **Difficulties with Implementation**

The implementation stage of emotion regulation process involves the execution of the specific strategy that has been selected, and implementation difficulties occur when there are problems in the perception, values, and action needed for the execution of adaptive emotion regulation strategies (Fernandez et al., 2016; G. Sheppes et al., 2015).

First, difficulties with perception occur when available methods for implementing the selected strategies are misrepresented, leading to temporal discounting responses (Nigg, 2017). Temporal discounting responses refers to the impaired ability to stay focused on actions that offer long-term benefits relative to courses of action with short term costs (Barkley, 2001). This is predominantly noted in ADHD, where misrepresentation of appropriate regulatory strategy leads to temporal discounting responses that manifest in impulse control problems(Barkley, 1997; Barkley, Edwards, Laneri, Fletcher, & Metevia, 2001).

Second, difficulties with valuation in the implementation stage occur when there is inaccurate appraisal of cost and benefits associated with the execution of strategies selected (Sheppes et al., 2015). The inaccuracies in the appraisal process are seen repetitive attentional deployment response that occurs in the persistent application of negative thinking patterns or incorrect assumptions in evaluating situations. These inaccurate assumptions and negative thinking patterns are seen in the frequent avoidance of uncertain situations in social anxiety and phobic-related disorders ( Borkovec & Roemer, 1995).

Finally, difficulties in action in the implementation stage involve significant impairments in the ability that is required for activating the methods of regulation strategies selected (Sheppes et al., 2015). The problem at this stage manifests in decreased flexibility in implementing alternative strategies that would be most adaptive (Joormann & Vanderlind, 2014). This decreased flexibility in emotional responding is often observed among individuals experiencing depressive symptoms who frequently exhibit limited ability in recalling positive emotions or analyzing information from different perspectives (Kross, Gard, Deldin, Clifton, & Ayduk, 2012; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). The decreased flexibility in emotional responding also manifests in ritualized behaviors associated with generalized anxiety and obsessive-compulsive disorders, where individuals persistently engage in frequent rumination and worrying as a way of minimizing the distress associated with the anxiety-provoking situation or event (McLaughlin & Nolen-Hoeksema, 2011; Nolen-Hoeksema et al., 2008).

Difficulties with implementation of adaptive strategies involve misrepresentation of adaptive strategies, inaccurate appraisal of benefits associated with adaptive strategies, and inflexible emotional responding that result in impaired ability staying focused, frequent engagement in negative thinking, and decreased flexibility in evaluating emotional response. These difficulties often result in diverse psychopathology symptoms that are related to ADHD, generalized anxiety disorder, major depressive disorder, and obsessive-compulsive disorder.

### **Difficulties with Monitoring**

After emotion regulation strategies have been selected and implemented to activate emotional responses, the Valuation system monitors the effectiveness of the strategies that have been implemented (Sheppes, et al., 2015). During the monitoring period, emotional responses are modified in two ways: switching and stopping (Sheppes et al., 2015). Switching consists of

replacing or changing of the implementation approach with a different method, while stopping involves bringing the overall activation of the regulatory process to an end (Sheppes et al., 2015). These processes lead to alteration in the intensity and or duration of the emotional response in order to make it more fitting to the situation. However, failure in the monitoring stage occurs when switching or stopping happens either too early or too late (Gross, 2014).

First difficulties relating to switching too early involve changing an effective regulatory approach or action too early when it is yielding adaptive outcomes. Examples include inconsistent or unstable thought or behavioral processes that are associated with mania in bipolar I disorder symptoms, including racing thoughts, distractibility, and difficulty staying on topic (Gruber, Eidelman, & Harvey, 2008; G. Sheppes et al., 2015).

The second type of failure associated with switching is switching too late, which occurs when there is a failure to discontinue the activation of the regulatory process when it is not effective (Kato, 2012). Switching too late has been demonstrated in rigidity in thinking associated with symptoms of disorders such as OCD, anxiety, and depression (Kato, 2012).

The first type of failure associated with stopping is stopping too early. This occurs when an individual discontinues a regulatory action prematurely, when in fact it would be effective if given more time (Sheppes et al., 2015). This is seen in dysfunctional coping in social situations where low confidence in an individual's ability to successfully apply a strategy to regulate emotions results in low emotion regulation efficacy (Goldin et al., 2013). This has been indicated in dysfunctional coping in social anxiety owing to perceptions of poor performance in evaluative and social contexts (Goldin, Manber, Hakimi, Canli, & Gross, 2009).

The second type of failure associated with modifying emotion in the regulatory process is stopping too late. This is observed in rumination where the desired change did not occur and yet

there is a failure to stop, even though a strategy or action has been applied sufficiently enough (Sheppes et al., 2015). This type of failure has been indicated in the symptoms of generalized anxiety disorder and major depressive disorder (Nolen-Hoeksema et al., 2008; Watkins & Nolen-Hoeksema, 2014).

Difficulties with monitoring involves failures in monitoring the implementation of emotion regulation strategies by switching or stopping the regulation strategy either too early or too late. Difficulties with monitoring have been associated with psychopathological conditions such as impulse control difficulties and difficulties in engaging in goal-directed behaviors that are predominantly observed in the symptoms of mood- and anxiety-related disorders, as well as substance use disorders and borderline personality disorder (Abbey, Smith, & Scott, 1993; Holahan, Moos, Holahan, Cronkite, & Randall, 2003).

In general, the extended process model has been linked to emotion regulation difficulties that are seen in several psychopathologies, including anxiety- and mood-related disorders, phobic disorders, substance use disorders, self-harm and suicide, mania and schizophrenia, among others. This is because the disruptions that occur at the various stages in the emotion generation process lead to problematic emotional responses resulting in emotion regulation failure or emotion mis-regulation. The emotion regulation failures manifest in difficulties relating to the identification of the type of emotion to be regulated, selection of a strategy to regulate the emotion, implementation of the strategy selected, and monitoring of the implemented strategy to evaluation its effectiveness. These difficulties have been indicated across diverse disorders, providing support for characterizing emotion regulation difficulties as a transdiagnostic construct across psychopathologies. Empirically, other studies exploring emotion regulation as a transdiagnostic etiology have provided evidence further supporting the role

emotion regulation difficulties play in the onset, course, and maintenance of diverse psychopathology symptoms (Aldao et al., 2010; Cludius, Mennin, & Ehring, 2020; Fernandez et al., 2016; Sloan et al., 2017). These evidence, among others, have over the years led to the proliferation of transdiagnostic models of psychopathology that emphasize understanding psychopathology symptoms based on disorder etiology (Dalglish, Black, Johnston, & Bevan, 2020; Eaton et al., 2015; McEvoy et al., 2018).

### **Transdiagnostic Model of Psychopathology**

The transdiagnostic model of psychopathology emphasizes the role of risk factors, as well as the context of the individual's interpersonal, social, and cultural environments, that cut across the onset, development, and maintenance of psychopathology symptoms (Clark, Cuthbert, Lewis-Fernandez, Narrow, & Reed, 2017; Harvey, Watkins, & Mansell, 2004). According to Harvey et al. (2004), a transdiagnostic risk factors or constructs must present at least two functional characteristics (1) it must be present or elevated across a range of disorder symptoms (in comparison to healthy controls) and (2) it must contribute to the onset and maintenance of disorder symptoms. In sum, the functional characteristics of transdiagnostic constructs must explain patterns of equifinality and multifinality in the trajectories of disorder symptoms (Cicchetti & Rogosch, 1996; Nolen-Hoeksema, 2011). The multifinality trajectory indicates the general contribution of the transdiagnostic construct to the development of diverse disorder symptoms, whereas the equifinality characteristic refers to how the unique contribution of the transdiagnostic construct, as well as its interaction with multiples factors, lead to specific disorder symptoms (Cicchetti & Rogosch, 1996; Eaton et al., 2015). These operationalizations of transdiagnostic constructs are meant to help explain the deficits in our current understanding of psychopathology symptoms that is based on categorical models of disorders.

The transdiagnostic approach to understanding psychopathology symptoms seeks to fill the knowledge gaps in the traditional diagnostic and classification paradigms of the Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Diseases (ICD), by offering approaches that evaluate disorders in terms of the etiological factors that underlie them. The widespread use of the diagnostic paradigm has stemmed primarily from sociopolitical and pragmatic reasons (Akram, Kawa, & Giordano, 2017; Kawa & Giordano, 2012). Socio-politically, the diagnostic paradigm confers legitimacy on psychopathologies, as it uses the biomedical model to conceptualize mental health problems (Kawa & Giordano, 2012). The broad social, professional, and academic appeal associated with the diagnostic approach has helped to reduce and deflect the pejorative connotations that are often associated with mental health issues (Dalglish et. al., 2020; Kawa & Giordano, 2012), providing an organizing framework for assessment, diagnosis, and treatment of disorders. This presents a common language that facilitates communication among clinicians, patients, and researchers (Akram et al., 2017; Hayes & Hofmann, 2018).

Regardless of these advantages, studies indicate that the diagnostic paradigm is encumbered with challenges that impede advancement of psychopathology research and clinical practice (Dalglish et al., 2020; Eaton et al., 2015; Regier, Kuhl, Narrow, & Kupfer, 2012). For example, the diagnostic paradigm does not account sufficiently for symptom overlap and comorbidity among disorders (Harvey et al., 2004; Hofmann & Hayes, 2019). Also, the diagnostic paradigm does not adequately take into account evidence that many specific risk factors lead to both unique and multiple disorders, while the same treatment model, such as the Unified Protocol for the treatment of emotional disorders, can ameliorate different disorder symptoms (Barlow et al., 2017). Additionally, studies have determined that psychopathology

symptoms reflect morphological variations, instead of ontological differences (Garland & Howard, 2013; Krueger & Eaton, 2015; Norton & Paulus, 2017), that stem from putative etiological constructs (Norton & Paulus, 2017). The putative etiological factors also manifest in the continuity of disorders across the developmental life span (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). For example, childhood and adolescent behavioral and psychological problems have been demonstrated to indicate early stages of later mental problems (Garland & Howard, 2013; Norton & Paulus, 2017). These findings have spurred interest among researchers to employ transdiagnostic approaches to investigate psychopathology (Krueger & Eaton, 2015; Lahey et al., 2015).

Overall, the transdiagnostic paradigm derives from a functional analytic perspective that utilizes methods and strategies that emphasize and integrate common factors that underlie the onset, maintenance, and course of disorders. The transdiagnostic paradigm seeks to enhance understanding of the psychopathology symptoms by offering explanation for symptoms overlap or comorbidity among disorders and how specific risk factors lead to the same or different disorders. The appeal associated with these underlying purposes of the transdiagnostic paradigm has led to the development of many transdiagnostic models. Existing transdiagnostic models of psychopathology include the hierarchical taxonomy of psychopathology, the network theory of psychopathology, p factor theory, and clinical staging model of psychopathology.

### **Examples of Transdiagnostic Models of Psychopathology**

A number of models have been formulated to explore psychopathology risk factors using the transdiagnostic paradigm. These models further consider the confluence of environmental and psychosocial factors, as well as their complex interrelations, in disorder symptoms. Examples of transdiagnostic models of psychopathology are the Hierarchical Taxonomy of



Psychopathology (HiTOP; Kotov et al., 2017), network theory (Borsboom, 2017), p factor model (Caspi et al., 2014), and clinical staging model (Scott et al., 2013).

### **Hierarchical Taxonomy of Psychopathology (HiTOP)**

The Hierarchical Taxonomy of Psychopathology (HiTOP) model is a phenotypic transdiagnostic model that classifies and characterizes disorders based on their physical features (Kotov et al., 2017). It organizes symptoms of psychopathology into hierarchical dimensions (Kotov et al., 2017), which are used for elucidating disorder continuity, chronicity, and levels of functional impairments. The disorder discontinuity and levels of functional impairments are used for establishing specific diagnostic cut-offs based on the degree of deviations in symptoms associated with specific symptom spectra (Kotov et al., 2017), whereas the dimensions of disorder continuity are used for addressing problems of arbitrary boundaries that results from subthreshold diagnosis (Eaton et al., 2015). Based on this, the HiTOP model addresses the problem of comorbid disorders by identifying in a hierarchical pattern how features at different levels of symptoms spectra are related in the overall presentation of the disorder (Kotov et al., 2017). For example, the HiTOP model has been used to explore the role of various etiological factors, including emotion regulation difficulties, in internalizing and externalizing disorders (Caspi et al., 2014).

A study using a series of factor analysis examined disorder-related factors in internalizing and externalizing conditions and provided support for a bifactor model that highlighted the role of emotion regulation difficulties across symptom presentation (Kim & Eaton, 2015; Morey, Krueger, & Skodol, 2013). The specific maladaptive emotion regulation patterns that were indicated in the internalizing and externalizing conditions were distress, fear, antagonism and disinhibition. (Caspi et al., 2014). These maladaptive patterns of emotion regulation were found

to underlie diverse psychopathology symptoms relating to major depressive disorder, generalized anxiety disorder, posttraumatic stress disorder, bulimia and anorexia nervosa, oppositional defiant disorder, ADHD, substance-related disorders, etc. (Caspi et al., 2014).

### **The Network Theory of Psychopathology**

The network theory is a hypothetical transdiagnostic model of psychopathology that highlights the structure and dynamics of relationships among disorder symptoms using a network approach. It assumes that disorders do not reflect latent underlying causes, but instead they occur from complex reciprocal interrelations among symptoms (Borsboom, 2017; Borsboom & Cramer, 2013). This model is based on a mathematical theory that uses a series of hypotheses to explain disorder causes, disorder threshold and severity, and disorder comorbidities. Specifically, it uses the causality and connectivity hypotheses to explain disorder causes, the centrality hypothesis to explain disorder severity and threshold dimensions, and the comorbidity hypothesis to explain the underlying mechanism of co-occurring disorders (Borsboom, 2008; Cramer, Waldorp, Van Der Maas, & Borsboom, 2010).

The causality hypothesis postulates that causal relations between symptoms precipitate the onset of symptoms that lead to the development of disorders (Borsboom, 2008; Cramer et al., 2010). According to this theory, symptoms of disorders cause each other, with changes in symptoms affecting the probability of distribution of other symptoms (Borsboom, 2017). Thus, psychopathology symptoms are conceptualized as continuous entities, forming direct connections and influencing each other in a complex dynamic of network structure (Boschloo, Schoevers, van Borkulo, Borsboom, & Oldehinkel, 2016).

The connectivity hypothesis states that the complex interactions occurring among corresponding symptoms in the network structure form a pattern of self-sustaining direct casual

connections between themselves (Goekoop & Goekoop, 2014). This process results in a contagion effect that leads to a spread of activation among the symptoms.

The centrality hypothesis is used to explain the causes of symptom severity and diagnostic thresholds. According to the centrality hypothesis "central" symptoms (those possessing strongest inter-symptom connections) cause the spread of activation that cuts across diverse symptoms (Cramer et al., 2016). The spreading activation occurring among connected networks are dimensional (Cramer et al., 2010), leading to waxing or waning in the severity of symptoms and resulting in distinctive thresholds that separate health and clinical symptoms (Borsboom et al., 2016).

The comorbidity hypothesis is used to explicate the underlining mechanism of co-occurring symptoms or disorders. The comorbidity hypothesis postulates that symptom activation spreading between syndromal nodes results in multiple disorders, reflecting in changes in inter-symptom relationships (Cramer et al., 2010). Additionally, "external stressors" can trigger the activation of symptom interconnections and cause an increase in the severity of existing symptoms or result in the production of additional disorders (Fried & Cramer, 2017).

The network theory has been used to explore the functional relations between positive appraisal of emotional responses and repetitive negative thinking and their association with symptoms of mood and anxiety disorders (Everaert & Joormann, 2019). Using a partial-correlation network model, Everaert and Joorman (2019) observed significant differential effects of positive appraisal of emotions and repetitive negative thinking on clinical experiences of guilt, shame, nervousness, and fear. They found that appraisal of positive emotions and repetitive negative thinking were central in connecting these symptom clusters of depression and anxiety. In depression, repetitive negative thinking was highly connected with guilty feelings and changes

in appetite. Among anxiety symptoms, negative appraisal of emotions and repetitive negative thinking demonstrated significant connections with fear of losing control, fear of the worst happening, nervousness, and difficulty relaxing (Everaert & Joormann, 2019; Ruscio, Haslam, & Ruscio, 2013).

### **p Factor Model of Psychopathology**

The p factor represents an index of functional deficits in disorders that is associated with multiple psychopathology symptoms. The p factor model of psychopathology postulates that all psychiatric disorders are underlined by a general latent liability that cuts across all disorder symptoms (Caspi et al., 2014; Laceulle, Vollebergh, & Ormel, 2015). The p factor has been extensively explored in the symptoms of internalizing and externalizing conditions, using a bifactor model (Caspi et al., 2014; Snyder, Young, & Hankin, 2017). The p factor in internalizing and externalizing conditions is constituted by elements of emotion regulation processes such as dispositional negative emotionality, impulsive responsivity to emotion, and low cognitive functioning, and disordered thoughts (Caspi & Moffit, 2018).

The dispositional negative affectivity to emotional responses represents negative affective states that are associated with frequent experiences of distress, sadness, and hostility that characterize symptoms of anxiety, depression, borderline personality disorder, and conduct disorders (Lahey et al., 2015; Markon, Krueger, & Watson, 2005).

The impulsive responsivity to emotion regulation indicates deficits in response inhibition that results in persistent rumination, neuroticism and over-generalization of negative events that occur in disorders such as OCD, bipolar disorder, and schizophrenia-related disorders (Abramovitch, Abramowitz, & Mittelman, 2013; Caspi & Moffitt, 2018).

The low cognitive functioning in emotion regulation represents neuroanatomical problems that increase vulnerability to developing problems in executive functioning that result in disordered thought processes, including deficits in attention, concentration, information processing, and problem solving (Caspi & Moffitt, 2018). Disordered thought processes manifest in clinical presentations of delusions, hallucinations, ruminations, irrational fears, and difficulties making decisions that are observed in PTSD, somatoform disorders, dissociative disorders, substance use disorders, and antisocial disorders (Caspi et al., 2014; Lahey, Krueger, Rathouz, Waldman, & Zald, 2017).

### **The Clinical Staging Model of Psychopathology**

The clinical staging model highlights, across the developmental lifespan, the distinct etiological factors that underlie disorder symptoms, in terms of how they develop and intensify (Eaton, Badawi, & Melton, 1995; Scott et al., 2013). It identifies disorder etiology along the developmental course of individuals. Studies show that emotion regulation problems, such as rumination, negative emotionality, impulsivity, disinhibited thoughts, and maladaptive strategies, are associated with specific disorders throughout the developmental course of individuals.

Ruminative response style, for example, has been identified as a putative risk factor in childhood anxiety and depressive symptoms (Grierson, Hickie, Naismith, & Scott, 2016). Also, difficulties with perception of emotions and use of inappropriate regulation strategies have been accounted for the onset of childhood anxiety, depression, and conduct disorder syndrome (Aldao et al., 2010; Schäfer, Naumann, Holmes, Tuschen-Caffier, & Samson, 2017). Maladaptive regulation strategies have been found in the experiences of mood-related symptoms in depression, bipolar, and cyclothymic disorders among individuals between ages 18 – 20 (McGrogan, Dodd, & Smith, 2019; Scott et al., 2013). Within the same group, disordered

thought conditions and maladaptive emotional responses have also been found to lead to dysphoric- and psychotic-related disorder symptoms (Černis et al., 2016). And extensive ruminative response style and disordered thoughts patterns present vulnerability for experiencing hallucinations, alcohol and substance use problems, and bipolar disorder symptoms in adulthood (Grierson et al., 2016; Johnson, McKenzie, & McMurrich, 2008).

These transdiagnostic models of mental disorders broadly illustrate the functional roles of the homotypic and heterotypic liabilities that are associated with the development, course, and maintenance of disorder symptoms. In general, transdiagnostic models of psychopathology follow research considerations that underscore disorder etiology, disorder categories and dimensions, disorder diagnostic threshold, and disorder comorbidity.

## **Research Considerations in the Transdiagnostic Models of Psychopathology**

### **Disorder Etiology**

One of the bases of the transdiagnostic approach is a focus on identifying and understanding etiological factors in disorders (Insel, 2012). Even though, the predominant diagnostic systems emphasize signs and symptoms of disorders, they nonetheless acknowledge the complexity of potential causal factors in the onset and prognosis of disorders. For example, the DSM-5 states that "the range of genetic/environmental interactions over the course of human development affecting cognitive, emotional and behavioral function is virtually limitless" (APA, 2013, p.19) and forewarns that "a diagnosis does not carry any necessary implications regarding the etiology or causes of the individual's mental disorder" (APA, 2013, p.25). Therefore, the transdiagnostic paradigm builds on this observation by emphasizing deviations in psychobiological factors that lead to disorder symptoms, while simultaneously paying attention to interaction of these factors with events that occur in the context of the person's interpersonal,

social, and cultural relations (Clark et al., 2017). Based on this understanding, a range of transdiagnostic constructs have been identified to underlie diverse disorders.

For example, researchers have indicated aberrant reductions in cortical synapses, synaptic pruning (Sekar et al., 2016) and reductions in grey matter (Cannon et al., 2015) as critical predispositional factors in the onset of schizophrenia spectrum disorder. Further, these factors combine with other environmental stressors (e.g., physical and sexual abuse or experience of trauma) to lead to episodes of schizophrenia prodrome or overt episode of psychosis (Rapoport, Giedd, & Gogtay, 2012). Another example, the Bipolar and Schizophrenia Network on Intermediate Phenotypes project (Tamminga et al., 2013) used cluster analysis to extract self-regulatory functioning and sensorimotor reactivity as factors that precipitate synaptic pruning and grey matter losses that result in the manifestation of psychotic phenotypes (Clementz et al., 2016). These studies, among others, have focused on understanding transdiagnostic constructs across symptoms of disorders by highlighting the common factors that underlie them.

### **Disorder Categories and Dimensions**

The transdiagnostic approach uses a dimensional approach for exploring the full range of the underlying constructs of disorders and their severity (Eaton et al., 2015; Krueger & Eaton, 2015). Evidence of dimensional characteristic of disorders abound in research. For example, the functional characteristics of personality disorders including “pathological traits”, such as negative emotionality and impulsive responsivity, are continuous (Caspi et al., 2014; Lee Anna Clark, Watson, & Reynolds, 1995). Symptoms of major depressive disorder like loss of interest and low motivation are also continuous in their range of functional impairments (Clark, 1995). Similar patterns are also observed in disorder symptoms such as worry, rumination,

hallucinations and delusions (Van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009).

The transdiagnostic paradigm uses the dimensional approach to explore disorders for three reasons. The first reason is to direct efforts towards a broad-base understanding of the multiple factors that intersect across time and context to lead to psychopathologies (Insel, 2012). The second reason is to provide a quantitative framework for conceptualizing treatment intervention by offering an empirical framework for validating scales for mental functions and behaviors that are needed for identifying person-specific behaviors and characteristics that trend towards dysfunction. The third reason is to offer a framework for assessing behavioral and biological dysfunctional levels across the full range of normal-to-abnormal spectrum of disorders (Lee Anna Clark, Cuthbert, Lewis-Fernández, Narrow, & Reed, 2017). By exploring multiple factors that intersect across time and empirical methods for conceptualizing cognitive and behavioral functions, the transdiagnostic approach is able to assess and address the range of functional impairments associated with disorders (Clark et al., 2017).

### **Disorder Diagnostic Thresholds**

The transdiagnostic paradigm is flexible in its use of thresholds for diagnosis. It focuses on exploring the range of mental functioning, by covering the full range of asymptomatic risk states that precede the development of clinical symptoms of disorders (Cuthbert & Insel, 2013), and providing more sensitive assessments relevant to understanding functional impairments and disorder interventions (Clark, et al., 2017).

The implication for this approach includes highlighting the significance of the functions of constructs that underlie disorders (e.g., cognitive and emotional functioning) and permitting sound quantitative approach for assessing them. Assessment of functional impairments include



quantifying index of disability or impairments associated with symptoms of disorders and examining psychopathology from multiple dimensions (Lilienfeld & Treadway, 2016).

### **Disorder Comorbidity**

Mental disorder comorbidity research indicates that operational definitions and classification of disorders in the DSM and ICD are overly simplistic (Lilienfeld & Treadway, 2017) and do not strongly align with empirical patterns of comorbid disorders (Clark et al., 2017). This is because etiological mechanism of comorbid disorders in psychiatry and medicine are different. For example, in medicine comorbid diseases can occur through random co-occurrence, where two diseases with distinct signs, symptoms, and etiologies can coexist. An example includes carpal tunnel syndrome and flu (Kraemer, 1995). These diseases frequently co-occur and are not conceptually difficult to distinguish, based on their signs and symptoms. However, in psychiatry pure and uncomplicated symptoms of psychiatric disorders are relatively uncommon, and it is even argued that some distinct disorders are better conceptualized as aspects of a single disorder (Eaton et al., 2015; Kessler, Adler, et al., 2005). For example, both major depression and bipolar-II are characterized by one or more severe depressive episodes, including experiences of depressed mood, loss of interest, sleep disturbance, agitation, and fatigue. It seems unlikely that the shared symptoms among these distinct disorders are completely random.

There are systematic patterns among comorbid disorders (Kessler et al., 2012). For example, comorbidity of specific disorders, such as major depressive disorder (MDD) and generalized anxiety disorder (GAD), has been explained by shared underlying constructs such as negative affectivity, rumination, and attention biases (Aldao & Nolen-Hoeksema, 2012; Mineka, Watson, & Clark, 1998). Also, structural analysis of acute threat in fear-related disorders indicates that a dysfunction in the fear circuit, leading to deficient emotion regulation processes,

underlies the range of symptoms that are associated with anxiety-related disorders like panic disorder, social anxiety, and specific phobias (Milad, Rosenbaum, & Simon, 2014; Watson, 2005). It can, therefore, be inferred from these examples that comorbid disorders are functionally associated, and the observed relations among them signify complex relationship in the shared risk factors that underlie them.

Based on these research considerations, a number of limitations have been found in the existing transdiagnostic models of psychopathology, leading to the current study.

### **Current Study**

The existing transdiagnostic models of psychopathology are mostly atheoretical (Lilienfeld & Treadway, 2015; Nolen-Hoeksema, 2011), as there is absence of a well-grounded conceptual formulations backing their fundamental assumptions. This has resulted in an explanatory vacuum regarding rampant psychiatric comorbidity, frequent symptom heterogeneity within disorders, non-specificity of disorder symptoms, and structure of psychopathology etiology. Current study sought to address these limitations by exploring emotion regulation difficulties as a functional transdiagnostic construct across symptoms of anxiety- and mood-related disorders.

### **Limitations in Existing Transdiagnostic Models of Psychopathology**

#### **Rampant Psychiatric Comorbidity**

Existing transdiagnostic models of psychopathology have had difficulties explaining the mechanism underlying co-occurrence of two or more disorders (Nolen-Hoeksema, 2011). Evidence indicate that several disorders co-occur (Kessler, Berglund, et al., 2005). For example, the Australian National Survey of Mental Health and Well-being indicated that 21% of individuals with one disorder met criteria for two or more other disorders (Andrews, Slade, &

Issakidis, 2002). Kessler et al. (2005) also found through analysis of the US National Comorbidity Study that 22% of individuals carried 2 diagnoses, while 23% individuals carried 3 or more diagnoses. However, it is unclear in the literature how the underlying structure of the etiology of comorbid disorders are constituted. Therefore, it is important for transdiagnostic models of emotion regulation to explain the structural mechanism of the shared etiological factors that cut across disorders.

### **Frequent Symptom Heterogeneity within Disorders**

The polythetic criteria of the DSM and ICD generate markedly high amount of symptom heterogeneity. The polythetic criteria show that within a disorder category there are clusters of symptoms that are heuristically similar (Dalglish et al., 2020). For example, the diagnostic criteria for PTSD could be met through no less than 636,120 ways, as there are multiple ways of experiencing a trauma, including an actual trauma event happening to an individual, an individual witnessing traumatic events that happen to others, and an individual learning that a traumatic event has occurred to a family person or close friend (Galatzer-Levy & Bryant, 2013). Also, it was demonstrated that there are about 16,400 symptoms profiles of major depressive disorder in the DSM-5 (Fried & Nesse, 2015). These examples indicate that many different sequelae of symptoms presentation can be combined to constitute a disorder. As a result, transdiagnostic models of emotion regulation should explain the underlying mechanism of the enormous heterogeneity within the symptoms of disorders.

### **Non-Specificity of Disorder Symptoms**

The DSM and ICD classification systems were developed based on the neo-Kraepelinian framework for classifying physical illnesses. This framework is a based on categorical diagnostic system that assumes that signs and symptoms of disorders are influenced by distinct etiological

factors (Kraepelin, 1920). Based on this assumption, the diagnostic systems of mental disorders presume that the underlying architecture of psychopathology, which manifests in signs and symptoms, is distinct and specific.

However, studies indicate that disorder symptoms vary between individuals and also morph across developmental course, such that individuals presenting the same risk factors can meet criteria for different disorders or present diverse functional impairments across situations and time (Dalglish et al., 2020; Fichter, Quadflieg, Fischer, & Kohlboeck, 2010). For example, patients presenting the same risk factors might shift between symptoms of anxiety and depression, such as hypervigilance, fatigue, loss of interest in leisure activities and feelings of sadness, across settings. The symptoms could also vary between experiences of excessive worry, loss of concentration, feelings of guilt, and lack of motivation depending on individual goals and time.

It is noted that environmental and psychosocial factors impact the symptoms and course of disorders (Liang, Berger, & Brand, 2019; Organization, 2015). For example, adverse life events and personality factors have been identified as nonspecific risk factors that significantly influence symptoms associated with depression, anxiety, and substance use disorders (Molnar, Berkman, & Buka, 2001). These findings explicitly challenge the assumption that symptoms of disorders are influenced by distinct and categorical factors. Further, based on evidence from differential-susceptibility hypothesis, the process by which individuals with the same gene variants for a disorder either experience better or worse outcomes depending on the nature of the environment in which they live, psychosocial factors have been found to partly account for psychopathology development and maintenance (Belsky, 2016). It is, therefore, important for

transdiagnostic models of emotion regulation to account for the relative contributions of psychosocial factors to the symptoms of disorders.

### **Structure of the Etiology of Psychopathology Symptoms**

The DSM and ICD classification systems use a categorical approach, mostly, based on a taxometric system for classifying disorders. The taxometric system allows for the decomposition of the observed distribution of a disorder into distinct, independent, and categorical phenomena (De Boeck, Wilson, & Acton, 2005; Lilienfeld & Treadway, 2016; Meehl & Golden, 1982). Based on this, symptoms are organized according to polythetic threshold criteria, establishing “present” versus “absent” binary notions (Regier, Kuhl, & Kupfer, 2013). This organizational format permits the ability to rule out self-limiting or non-distressing syndrome which are part of regular life hustles (Kupfer, Kuhl, & Regier, 2013), and thereby reducing false positive cases (Regier, Narrow, Kuhl, & Kupfer, 2009). However, this binary notion for disorders has been challenged by a lack of an explicit point of rarity separating clinical symptoms from normality (Lilienfeld & Treadway, 2016).

Critics of the binary notion of disorders have pointed to specific symptoms that do not give any indication of pathology by themselves (e.g., feeling of sadness associated with the loss of a loved one), asking if each symptom must elevate itself to the level of severity in order it to be counted or if they need to occur concurrently with other symptoms to be counted. As a result, they assert that the diagnostic criteria conflate disability with symptoms of disorders (Narrow & Kuhl, 2011). For example, it is difficult to distinguish symptoms of externalizing disorders like substance use and ADHD from their associated functional impairments. Among individuals with ADHD, there is considerable overlap between symptoms of inattention and hyperactivity-impulsivity and their associated functional impairments, such as fidgeting, inability to stay

seated, disorganization, losing materials and intruding in other people's activities. The relationship seems cyclical, which makes it difficult to delineate disorders from their phenotypic characteristics, thereby hindering attempts at exploring disorder etiology (Judd et al., 2004; Oxman, Bjørndal, Flottorp, Lewin, & Lindahl, 2008).

Based on this, the categorical approach to describing psychopathology has been described as purely conceptual artefact with no empirical basis in research or practice (Narrow & Kuhl, 2011; Spitzer & Wakefield, 1999), as it does not provide any guidance on the underlying impairments in functioning that constitute disorder symptom. Studies indicate that conceptualizing disorders based on their underlying etiology would yield more valuable information, by highlighting the functional liabilities in disorder symptom presentation, for clinical and research purposes (Brown et al., 2001; Kessler, Adler, et al., 2005). Therefore, it is essential for transdiagnostic models of emotion regulation to explore the nature of the liabilities in emotion regulation problems that underlie symptoms of disorders.

### **Exploring Emotion Regulation as a Transdiagnostic Construct**

Current study explored emotion regulation difficulties as a functional transdiagnostic construct by exploring the nature of its factor structure that underlies disorder symptoms. This is because a transdiagnostic model of emotion regulation difficulties must address questions regarding its categorical and distributional characteristics in disorder symptoms, as well as its measurement invariance across the population. Delineating the categorical and distributional characteristics of emotion regulation difficulties would highlight how it is dispersed in the population, while its measurement invariance would facilitate shedding light on how it is similar across diverse populations based, for example, on sex, age, and race. It was postulated that such delineation would help highlight the functional characteristics of emotion regulation difficulties

that underlie comorbidity among disorder symptoms, non-specificity of disorder symptoms, and unique and shared liabilities of disorder symptoms. Based on these assumptions, the study aims and hypotheses were formulated.

### **Study Aims and Hypotheses**

*Study Aim 1: Test the factor structure of emotion regulation difficulties.*

**Hypothesis 1a:** Explore the dimensional structure of emotion regulation difficulties using exploratory factor analysis.

**Hypothesis 1b:** Explore the categorical structure of emotion regulation difficulties by using latent profile analysis.

**Hypothesis 1c:** Explore the hybrid structure of emotion regulation difficulties using exploratory factor mixture analysis

*Study Aim 2: Test the measurement invariance of emotion regulation difficulties across diverse groups based on sex, age, and race.*

**Hypothesis 2a:** The best fitting model of emotion regulation difficulties would be invariant across all groups.

*Study Aim 3: Explore the relations between emotion regulation difficulties, adverse life events, and psychopathology symptoms associated with anxiety, depression, and borderline personality disorder.*

**Hypothesis 3a:** Emotion regulation difficulties would be significantly associated psychopathology symptoms associated with anxiety, depression, and borderline personality disorder.

## CHAPTER 2

### METHOD

#### **Procedure**

Solicitations for study participation were made through course announcements and posts on the University of Mississippi Sona Systems' website, where interested students could read a summary of the study requirements and choose whether to enroll. Participants who expressed interest were emailed a Qualtrics link through which they read and provided informed consent. Following completion of consent, they were asked to complete the aforementioned study questionnaires (again through Qualtrics). It was estimated that the completion of the questionnaires would take approximately between 15 minutes to 1 hour, and, therefore, they were credited one hour after the study completion.

Additional study participants were solicited through other valid and reliable online systems for collecting data (Facebook, Reddit, MTurk and Prolific), with the aim of increasing the power for an effective and successful estimation of the factor structure of emotion regulation construct. Survey web-link (via Qualtrics) were posted on these websites and interested participants provided informed consent. After consent, they were then directed to the questionnaires that were embedded in Qualtrics links. All procedures were approved by the University of Mississippi's Institutional Review Board prior to study commencement

#### **Sample Size Estimation**

The estimated total sample needed was based on the factor analysis and exploratory factor mixture models of the study, following the Monte Carlo simulation by Lubke and Neale



(2006). A total sample of at least 330 participants were needed for the study to keep power over 0.8. The projected sample estimate included an extra 10% of the actual sample size recommended for achieving this level of power (Gitta Lubke & Neale, 2006), to allow for potential missing or unusable data. The models were expected to have convergence rates above 95% with within-class sample sizes of at least 70 for a large class separation. The prior class probabilities were estimated to be at least .5 for a three-class model while the parameter and standard error biases were expected to be less than 2.5%. These estimates were considered sufficient for significantly detecting all between- and within-class parameterizations in the models and achieve a power of above 0.8 (Gitta Lubke & Neale, 2006; Muthén & Muthén, 2002).

## **Participants**

Participants for the study were recruited through Sona Systems and social networking websites. The Sona is a web-based survey platform run by the Department of Psychology at the University of Mississippi. It was used in the study to recruit the university-based sample. Social networking websites, primarily Reddit and Facebook, were used to recruit the additional sample, coming from various part of the US, for the study. Even though Prolific and Amazon Mechanical Turk were intended to be used as well for participant recruitment, they were not used as the aforementioned recruitment platforms proved sufficient for the study. The inclusion criterion for participation involved being at least 18 years of age or above and willing to provide study consent.

## **Measures**

### **Demographics Questionnaire**

A demographics form (based on NIH template) asking participants to indicate age, gender ethnicity, relationship status, education level, and family socioeconomic status was used to collect the participants' personal data. This information collected was used to understand the socio-demographic characteristics of the study participants.

### **Self-report Measures**

The *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004) is a self-report measure consisting of 36 items that comprehensively assesses overall emotion regulation difficulties. The items on the scale are rated using a 5-point Likert scale (1 = *almost never*, 5 = *almost always*), with higher scores on the scale indicating greater emotion regulation difficulties. The DERS has evidenced adequate construct and predictive validity and good test-retest reliability over a period of 4 to 8 weeks, with a  $\rho = .88$  (Gratz & Roemer, 2004). It has also demonstrated excellent internal consistency of Cronbach's  $\alpha = .92$  (Dan-Glauser & Scherer, 2013). For this study scores on the DERS were calculated with scores ranging from 36 to 173, and the internal consistency among the items was  $\alpha = .95$ .

The *Emotion Regulation Questionnaire* (ERQ; Gross, 1998) is a 10-item self-report measure that assesses an individual's use of emotion regulation strategies. The items are rated on a 7-point Likert-scale (1 = *strongly disagree*, 7 = *strongly agree*), with a higher score indicating greater use of strategy. The ERQ has demonstrated good concurrent/criterion validity and reliability (Cronbach's  $\alpha \geq .70$ ) across a diverse sample and culture (Gross & John, 2013; Gross, 1998b; Spaapen, Waters, Brummer, Stopa, & Bucks, 2014). This measure was also used as a part of the construct constituting emotion regulation problems, which was used to assess the construct validity of DERS for current study. For this study, the internal consistency among the ERQ items was  $\alpha = .71$ .

The *Beck Depression Inventory* II (BDI-II; Beck et al., 1996) is a 21-item, self-report measure that assesses depressive symptoms experienced over the past two weeks. The items are rated on a 4-point Likert scale ranging from 0 to 3, with a higher score indicating greater levels of depression. The BDI-II had demonstrated excellent internal consistency with a Cronbach  $\alpha = 0.92$  and excellent re-test reliability of .93 over a week period (Beck, Steer, Ball, & Ranieri, 1996). For this study, the total score indicated severity of depressive symptoms in the sample, and the internal consistency among the items was  $\alpha = .91$ .

The *Beck Anxiety Inventory* (BAI; Beck & Steer, 1990) is a 21-item self-report measure that assesses anxiety experienced over the past month. Respondents indicate their experiences of anxiety symptoms on a 4-point Likert scale, ranging from 0 to 3 with a higher score indicating greater feelings of anxiety. The BAI has demonstrated good internal consistency with a Cronbach  $\alpha = .90$  (Beck & Steer, 1990; Steer, Ranieri, Beck, & Clark, 1993; Wetherell & Areán, 1997). It has also demonstrated good convergent and discriminant validity across diverse samples (Wetherell & Gatz, 2005). The BAI was used in the study to assess the experiences of anxiety symptoms among the participants, and the internal consistency among the items was  $\alpha = .91$ .

The *McLean Screening Instrument for Borderline Personality Disorder* (MSI-BPD; Zanarini et al., 2003) is a 10-item, true or false self-report measure for screening DSM-IV BPD. The MSI-BPD has a clinical cutoff score of seven, with seven or more symptoms suggestive of a diagnosis of borderline personality disorder. It has demonstrated good diagnostic reliability for Axis-II (personality) disorders of the DSM-IV (Zanarini, Frankenburg, Sickel, & Yong, 1996; Zanarini et al., 2003). Scores on this measure was used in the study as an estimation of the

participants' experiences of borderline personality disorder symptoms, and the internal consistency among the items was  $\alpha = .81$ .

The *Positive and Negative Affect Schedule* (PANAS; Watson et al., 1998) is a 20-item self-report measure, consisting of negative affect and positive affective traits. The positive affect subscale items are words that indicate excitement, energy and pleasure; the negative affect subscale lists words that constitute subjective distress characterized by unhappiness and lethargy (Watson, Clark, & Tellegen, 1988). Participants responded to the items as a trait and rated the items on a 5-point scale (1= very slightly or not all, 5= extremely), with a higher score indicating greater traits of positive or negative affects. The PANAS has demonstrated good convergent and discriminant validity across diverse samples with high internal consistencies in both general and clinical populations, with Cronbach alphas between .87 to .91 (Crocker, 1997; Leue & Beauducel, 2011). The subscales of this measure were computed to constitute negative and positive affective traits among the participants, and the internal consistency among the items was  $\alpha = .84$ .

The *Anxiety Sensitivity Index III* (ASI-3; Taylor et al., 2007) is an 18-item measure consisting of physical, cognitive, and social concerns. The items on the scale are rated on a Likert scale (0 = *very little concern*, 4 = *very much concern*) with higher scores indicating greater concerns with anxious arousals. Higher score on the physical concerns denotes excessive worry about the physical health conditions; higher scores on the cognitive concerns items indicate psychological symptoms of worry, such as concentration difficulties; and higher scores on the social concerns reflect anxiety symptoms associated with social rejection. The ASI-3 has demonstrated excellent internal consistency ( $\alpha = .93$ ), as well as excellent convergent and discriminant criterion validities (Ebesutani, McLeish, Luberto, Young, & Maack, 2014; Taylor et

al., 2007). The total scores were computed as the index of the participants' anxiety sensitivity for this study, and the internal consistency among the items was  $\alpha = .92$ .

The *Life Events Checklist* (LEC; Gray, Litz, Hsu & Lombardo, 2004) is a 17-item measure that screens for exposure to traumatic events that are known to be significantly associated with posttraumatic stress disorder symptoms (Gray, Litz, Hsu, & Lombardo, 2004; Weathers, Keane, & Davidson, 2001). Participants were asked to indicate the extent of their exposure (if any) to the traumatic events and the age at which they experienced or were exposed to the event. The LEC has demonstrated good reliability and acceptable convergent and divergent validity (Gray et al., 2004). It was used in the study to screen for environmental/external factors associated with psychopathology symptoms, and the internal consistency among the items was  $\alpha = .87$ .

### **Data Cleaning**

All the data screening and analyses were conducted using SPSS 24.0 (SPSS, 2013) and Mplus Version 8.4 (Muthén & Muthén, 1998)). Overall, 1613 participants completed the survey. The data was screened by investigating the survey completion time, descriptive statistics of each item for missing values and outliers, interitem correlations, and multivariate assumptions. The general time it took for completion of the survey was between 15 minutes and one hour, based on the results of the pilot test. Analysis of the participants' completion time led to the removal of thirty-four cases. The thirty-four cases completed the entire survey under 8 minutes, based on the record of participants' time spent on completing the questionnaire, and were removed for suspect effort leaving a sample of 1579. The results of the descriptive statistics of the variables indicated that all the values were within the accurate upper and lower boundaries associated with the items. Variables with at least 5% of the cases missing were examined for pattern of missingness. Analysis of the patterns of missing values showed that all the data were missing completely at

random (MCAR), with Little's (1998)  $\chi^2 > 0.5$ . This indicated that missing values were ignorable (Graham, 2009; Tabachnick, Fidell, & Ullman, 2007).

As a general rule, it is indicated that cases with z-scores greater than  $\pm 2.5$  are outliers and should be considered for possible deletion (Hair, Black, Babin, & Anderson, 2010). An examination of outliers for each variable, using box and whisker plots and values of z-scores, led to the removal of nine cases with z-scores exceeding the threshold of  $\pm 2.5$ . Six of the cases had z-scores greater than 4, and two cases had z-scores of less than 3. An assessment of multivariate outliers of the variables based on their chi square distribution and Mahalanobis distances indicated that none of the cases had items that reached a significant threshold for removal. All the cases had scores that were below the threshold for removal at an alpha level of 0.01 (Meyers, Gamst, & Guarino, 2016).

The assumption of multivariate normality was tested by examining the possible violations of the assumptions of normality, linearity, and homoscedasticity by the variables. Analysis of the data showed that all variable pairs were bivariate normally distributed, and all the cases were independent. The normal probability plots (Normal Q-Q plot) of the values of each variable indicated that the variables were normally distributed, as the response distributions of the items of all variables were neither excessively skewed or kurtotic, with values of less than  $\pm 2.5$  (Tabachnick & Fidell, 2013). Also, Shapiro-Wilk tests of the items of the variables indicated non-significant violations from normality with  $p > 0.01$ . The bivariate scatterplots of the variables indicated significant linear relationships between them, while both Box's  $M$  test for equality of variance-covariance matrices and Levene's test of homogeneity of variance among the variables were also non-significant.

Following the entirety of data cleaning, 1570 participants were deemed appropriate for analysis. The final sample consisted of 1132 females, 317 males, and 438 undisclosed. The demographic breakdown of the sample was as follows: 1305 White, 35 Black, 18 American Indian/Alaska Native, 100 Asians, and 112 other ethnicities. The participants ranged in age between 18 and 66 years, and the average age was 30 years. See table 1 for more details.

### **Conceptualization of Emotion Regulation Problems**

The difficulties in emotion regulation scale (DERS) was used in the study to operationalize emotion regulation problems. Originally, the study intended to decompose items of Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) and Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) to constitute the overall emotion regulation problems. However, correlations between items of ERQ and DERS indicated patterns of inflated correlations, with correlations of up to 0.95, making it statistically inappropriate or redundant to use them together. It appeared that items of the two measures share similar content. Additionally, there were differences in the range of responses on the two measures causing scaling problems in how the responses were matched quantitatively. The responses on the items of DERS ranged between 1 – 7, while items on ERQ ranged between 1 – 5. These issues of statistical redundancy and quantitatively mismatched responses between the measures made it prudent to use only one. Therefore, the study adopted the DERS based on its wide use and extensive evidence supporting its utility in conceptualizing emotion regulation problems (Gratz & Roemer, 2004; Sloan et al., 2017).

## CHAPTER 3

### RESULTS

The results consisted of outcomes obtained from the analyses of the study aims and hypotheses. The study aim 1 explored the factor structure of emotion regulation difficulties; study aim 2 tested the measurement invariance of emotion regulation difficulties across diverse population based on age, sex, and race; and, study aim 3 explored the relations between emotion regulation difficulties and psychopathology symptoms.

Study Aim 1: Explore the Factor Structure/Distributional Qualities of Emotion Regulation Difficulties

Hypothesis 1a: Explore the Dimensional structure of emotion regulation.

Exploratory factor analysis was used to examine the dimensional structure of emotion regulation difficulties. Descriptive analysis of the DERS items indicated that all items were based on interval scale, variable pairs were bivariate normally distributed, and all cases were independent. The response distributions of the items were neither excessively skewed or kurtotic, with values less than  $\pm 1.5$ , indicating that the items were normally distributed (Tabachnick et al., 2007). The Bartlett's test of sphericity was significant ( $p < .0001$ ), indicating adequate associations between the items for analysis. Generally, it is recommended that 10 to 1 ratio of participants to items is minimally required for adequate implementation of factor analysis (Nunally & Bernstein, 1978). For this study, analysis was performed on 1570 participants, with items-to-cases ratio far exceeding the recommendation. Further, Kaiser-Meyer-Olkin (KMO)



measure of sampling adequacy was .961, indicating that the data were sufficient for factor analysis. See Table 2 for detail results of the Bartlett's test of sphericity and KMO.

### **Extraction of the Dimensional Structure of Emotion Regulation Difficulties**

A common factor analysis using principal axis factoring method of extraction and Promax with Kaiser Normalization rotation was used to explore the variables. This approach was used to allow for correlations among the factors of emotion regulation difficulties (Floyd & Widaman, 1995). In extracting the number of factors, theoretical and statistical acceptability of the solution, including out-of-bound estimates and nonconvergence, were considered (Bauer & Curran, 2004). Indices of statistical goodness of fit were used to compare the factors. The indices of statistical goodness of fit employed in the study were the following: Bayesian Information Criterion (BIC), the Akaike Information Criterion (AIC), the sample-adjusted BIC (SABIC), Chi-Square Test of Model Fit, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI) and Standardized Root Mean Square Residual (SRMR), (Bentler, 1990). For these fit indices, lower values on the BIC, AIC, RMSEA and SRMR and higher values on the CFI and TLI suggest a better model. However, these fit indices can fail to reach a minimum or maximum for extracting the optimum number of factors. Therefore, the scree plot has been suggested for extracting the optimum number of factors in instances where these fit indices fail to reach a minimum or maximum (Floyd & Widaman, 1995; Morin, Arens, & Marsh, 2016). Additionally, the scree plot has been determined to be an accurate method for retaining the optimal number of factors with a degree of accuracy surpassing that of the Kaiser-Guttman criterion (Floyd & Widaman, 1995).

The results of the analysis indicated that the fit indices were not helpful for selecting the optimal number of factors as they continued to improve with the addition of new factors. Additionally, in instances where the fit indices reached minimum or maximum, the final solution failed to converge. Therefore, the scree plot became helpful in determining the optimal number of factors to retain and suggested extraction of six factors. The six factors accounted for 68.33% of the total variance in the model, with item loadings of  $\geq .40$ . The correlations between the factors ranged from 0.029 – 0.638. The results for the fit indices, factors extracted, eigenvalues and percentage of variance explained, item loadings, and factor correlations are presented in the Tables 3, 4, 5 and 6.

### **The Factor Structure of Emotion Regulation Difficulties**

The examination of the factors and their corresponding item loadings indicated that the factor structure of emotion regulation difficulties extracted was conceptually interpretable and valid, with regard to the multidimensional definition of emotion regulation problems (Gratz & Roemer, 2003; see Figure 1). Factor 1 represented nonacceptance of emotional responses (NONACCEPTANCE), with items indicating a propensity to respond negatively to distressing emotional experiences. Factor 2 reflected limited access to emotion regulation strategies (STRATEGIES), consisting of items that indicated limited belief in the ability to effectively manage negative emotional experiences. Factor 3 reflected lack of emotional awareness (AWARENESS), consisting of items that indicated difficulties in attending to and recognizing emotional experiences. Factor 4 reflected impulse control difficulties (IMPULSIVITY), consisting of items that indicated difficulties in maintaining control of one's emotional experiences. Factor 5 reflected difficulties engaging in goal-directed behavior (GOALS), with items indicating difficulties focusing and completing tasks when experiencing negative

emotions. Factor 6 reflected lack of emotional clarity (CLARITY), consisting of items that indicated limited ability to detect and distinguish experiences of specific emotions.

These six factors represented specific problems within emotion regulation that presented risk for psychopathology (Gratz & Roemer, 2004). The factors were moderately associated with each other, with correlations ranging from .074 - .632, and exhibited high internal consistency, with Cronbach alpha ( $\alpha$ ) = .833.

### **Hypothesis 1b: Explore the Categorical Structure of Emotion Regulation Problems**

Latent profile analysis (LPA) was employed to explore the categorical structure of emotion regulation problems by fitting a series of successive classes in an increasing order to the data. Latent profile analysis assumes that the correlations among the items or observed indicators are due to a latent variable with a categorical number of classes (Lazarsfeld & Henry, 1968; Vermunt, Lewis-Beck, Bryman, & Liao, 2004). For this study, the process was begun with a specification of a model, model testing, and class enumeration using Mplus.

The model was specified using random starting values (STARTS) = 5000, final-stage optimizations = 250, and starting iterations (STITERATIONS) = 20, with the aim of ensuring that the best model converged on the global maximum of the likelihood estimates. These starting or model specification values increased the initial-stage random starts values from the default of 20 to 5000, final-stage optimizations from the default of 4 to 250, and initial-stage iterations from the default of 10 to 20. The results of the analysis indicated that, for the first 250 sets of random starting values specified for final-stage optimizations, the best log-likelihood value was -80540.223, and it was associated with the 4042<sup>nd</sup> set of initial random starting values and corresponding random seed of 986875. For the model to converge successfully, the best log-likelihood value should be replicated multiple times, at least in the first three solutions (Nylund,

Asparouhov, & Muthén, 2007). For this study, the best log-likelihood of -80540.223 was replicated over 200 times, indicating a good model convergence.

To ensure that the model parameters were not being estimated from local solutions, the model was tested by specifying different random seeds using the OPTSEED option of the ANALYSIS command in Mplus, and then examined whether the model parameter that were estimated were identical for different seeds. The model was rerun using the following procedure in Mplus (i) add the statement OPTSEED = 9868751 to the ANALYSIS command; (ii) set STARTS = 0; and then (iii) run the model. The same procedure was followed using different seeds of 930781, 494115, and 286621. The model parameters estimated using these different seeds were identical, indicating that the model was identified and estimated based on global maximum of likelihood. The replication of the best likelihood estimates confirmed that the model was identified, allowing the profiles/classes to be enumerated. See Table 7 for a snapshot of the random starts results.

### **Profiles of Emotion Regulation Difficulties**

The profiles/classes of emotion regulation difficulties were enumerated based on considerations of theoretical and conceptual validity, relative indices of model fitness, and model parsimony. The relative fit indices used were Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), sample-size adjusted Bayesian Information Criteria (ABIC), parametric bootstrapped likelihood test (LRT), and entropy values (Nylund, et al., 2007). The model selection was based on the lower values of AIC, BIC and adj-BIC, a significant LRT, and highest entropy value (Nylund et al., 2007).

Several iterations of profiles of emotion regulation difficulties were run based on sequential increase in the number of classes relative to the previous. The fit indices indicated that a 2-class

solution provided the best fit relative to other class solutions (see Table 8). All the class solutions enumerated after the 2-class solution were either unidentified or failed to replicate. The two-class solution demonstrated very strong posterior probabilities (0.99 – 0.994) and meaningful class interpretability of low emotion regulation difficulties (Class 1) and high emotion regulation difficulties (Class 2), with an entropy value of 0.971. The entropy value exceeded the recommended entropy cut-off point of 0.70 (Nagin & Nagin, 2005). The larger class (Class 2) consisted of 57.3% of the participants while the smaller class (Class 1) consisted of 42.7% of the participants. Observation of the class profiles detailed clear separation between the two classes (see Figure 2). The class separation demonstrated that the direction of scoring across the variables was the same between the subgroups with quantitative differences indicating variations in the severity of emotion regulation problems.

### **Hypothesis 1c: Explore the Hybrid Structure of Emotion Regulation Difficulties**

Exploratory factor mixture modeling (EFMM) was used to explore the hybrid (categorical-dimensional) structure of emotion regulation difficulties. The hybrid structure of emotion regulation difficulties was explored by fitting variations of LCA and FA in the same model. The process involved simultaneously fitting LCA and FA models with increasing number of classes and factors until an end point was reached - the point at which the model fit indices fail to improve. The LCA models identified the independent populations in the data (the component of EFMM in which the factor covariance matrix is fixed at zero), whereas the FA models constituted the part of EFMM that helped to delineate the differences within the classes. The iterations for building the EFMM involved first fitting a 1-class, 1 factor model, followed by fitting a 2-class and 1 factor model, with the subsequent models following a similar pattern of increasing the number of classes followed by the number of factors. The iterations were paused

at 2-class, 6 factors solution, as the subsequent increase in the number of classes and factors failed to replicate the best the loglikelihood value. In mixture analysis it is important that the best loglikelihood value is replicated in at least two final solutions to assure that a trustworthy solution is achieved for the identified model (Nylund et al., 2007). A model without replicated solutions cannot yield meaningful parameter estimates, such as standard errors, as it produces a singular Fisher information matrix, a situation that occurs when unbiased estimates of the parameters in the model are impossible to execute (Nylund et al., 2007).

The 2-class, 6 factors solution pointed close to a local solution as the best loglikelihood value was replicated in only the first two subsequent models. However, an observation of the final stage optimizations results indicated that several of the loglikelihood values were close to the highest loglikelihood value. As a result, the parameter estimates for the solution were examined using the OPTSEED option in Mplus, a fit function for testing the maximization of the best solution (Asparouhov & Muthén, 2019). The highest loglikelihood of -80540.233 with 986875 initial stage starts value was used to estimate the final solution of 2-class, 6 factors model. The parameter estimates obtained using the OPTSEED were similar across the solutions, indicating that the model is well-defined for the data and pointed to a global solution. See Table 11 for details results of the global solution.

### **Enumeration of the Class and Factor Structure of the Hybrid Model**

A combination of statistical fit indices and the substantive interpretation of the profile plots of the models were used in selecting the best fitting model (Lubke, Muthén, & Larsen, 2002; Nylund et al., 2007). The statistical fit indices comprised the Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), sample-size adjusted Bayesian Information Criteria (ABIC), and entropy values (Nylund, et al., 2007). Even though, a 2-class, 1 factor model had

the highest entropy value, it produced the poorest AIC, BIC, and aBIC values. Comparatively, the AIC, BIC, and aBIC are rated higher than the entropic value in the selection of the best model (Nylund et al., 2007). Therefore, the 2-class, 6 factor model was selected as the best fitting model to the data as it produced the lowest AIC, BIC, and aBIC values.

The 2-class, 6 factors model produced a class count of 506 participants in class one and 1048 participants in class 2. The probability for the most likely class membership was 0.959 for class one, and 0.986 for class two, which are better than the cut-off point of 0.7 (Nagin & Nagin 2005). The entropy statistic, a standard summary of the classification accuracy of the estimated classes, was 0.92. Based on these information statistics, it can be concluded that the latent class membership classification was adequate. Details results of model fit indices, probability of the most likely class membership, and profile plots of the hybrid model are presented in Tables 12 – 14 and figure 3.

### **Comparison of the Dimensional, Categorical and Hybrid Structures of Emotion Regulation Difficulties**

The dimensional, categorical, and hybrid models of emotion regulation difficulties were compared using measures of statistical fit indices. The measures of fit indices consisted of Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC) and sample-size adjusted Bayesian Information Criteria (ABIC) (Nylund, et al., 2007). Additionally, the entropy measure was used to further assess the fitness of the models. The comparison of these measures of fitness for all the models estimated indicated that the 2-class, 6 factors hybrid model (Table 15, model 14) provided the best statistical fit to the data. Even though the 2-class model under LPA (model 8) produced the highest entropy value of 0.971, its AIC, BIC and aBIC values were poorer in comparison. Based on the evaluation of these measures of fit, a hybrid model

consisting of 2 categorical classes and 6 factors was indicated as the best underlying structure of emotion regulation difficulties. The categorical structure suggests that, across the population, emotion regulation difficulties are classified into two classes. The classes are high and low emotion regulation problems groups. The dimensional structure suggests that within the high and low classes the severity of emotion regulation problems can vary across six different areas of difficulty. The areas of difficulty are nonacceptance of emotional responses, limited access to emotion regulation strategies, lack of emotional awareness, impulsivity, difficulties engaging in goal-directed activities, and lack of emotional clarity.

### **Testing the Structural Invariance of the 2-Class, 6 Factors Model**

The structure of the hybrid (2-class, 6 factors) model was examined to determine its variation across the classes. The structural invariance was tested for factor covariance, variance, means, and loadings, with corresponding factor-mixture model variations of FMM-1, FMM-2, FMM-3 and FMM-4. The evaluation of the structural invariance started with the estimation of the more restrictive models since their interpretations are less cumbersome (Clark et al., 2013). As a result, the FMM-1 structural invariance was tested first. Statistically, estimation of the FMM-1 stipulates that all measurement and structural parameters are invariant except the factor means in the population. Therefore, to execute the FMM-1 model the means of the items and factor loadings were held invariant across the classes, while the covariance among the factors were fixed to zero, indicating zero within-class differences. The model estimates for the best solution of the FMM-1 model failed to converge. This indicated that the differences within the classes were not qualitative.

The second variation, FMM-2, was estimated by freely estimating the factor variances and covariance associated with the 2-class, 6-factor FMM. The FMM-2 model suggests that the



variation of emotion regulation difficulties in the population is due to differences in the latent structure of emotion regulation (Clark et al., 2013). The model estimates for the best solution of the FMM-2 variation did not converge, indicating that the differences between the classes are not due simultaneously to the variance in the underlying factor of emotion regulation difficulties.

The third model variation FMM-3 was estimated by fixing the factor loadings and varying the item means and factor covariances of the model across classes. The FMM-3 is different from the previous models because the differences in the classes are attributed to variation in the responses to the items, indicating that the observed differences in the two classes are due to unique individual characteristics (Clark et al., 2013). As a result, this model is able to model variances within each class. And having a distinct factor covariance matrix for each class means presence of heterogeneity within the classes. The FMM-3 variation of the best solution fully converged and replicated the best loglikelihood values. The final model variation, FMM-4, was estimated by allowing items means, factor loading and factor covariances to freely vary across the classes. FMM-4 variation of the best solution did not converge, as the best loglikelihood values failed to replicate. Therefore, the FMM-3 variation of the 2-class, 6 factors model was selected as the best fitting model for the data (see Table 16 for details).

Conceptually FMM-3 makes sense because the invariant factor loadings across the classes suggest that the differences in the population are due to differences in responses to the observed items rather than differences in the latent factor of emotion regulation difficulties. Also, the intercepts and covariances that were allowed to vary imply that within-class differences are attributable to differences in the levels of the six factors of emotion regulation difficulties. Structurally, these differences confirm the distinctive low and high classes and six within level factors that were enumerated.

Overall, the best fitting model to the data consisted of a 2-class, 6 factors model in which factor loadings were invariant while intercepts and factor covariances varied across classes, thus explaining both between- and within-class differences in the population. The classes consisted of a relatively large class of individuals with elevated scores in emotion regulation difficulties (high-DERS class) comprising 52% of the sample, and a comparatively smaller class of individuals (48% of the sample) presenting normative levels of emotion regulation difficulties (see Table 17). All individuals in the two classes had approximately equal probability ( $p = 0.96$ ) of being in their respective groups (see Table 18), and an entropy classification quality value of 0.864.

### **Validity of the 2-Class, 6 Factors Model**

The validity of the hybrid model was tested by examining the validity of the classes and factors in the model.

### **Validity of the DERS-Class Status**

The validity of emotion regulation class status was tested by examining the degree of association of the classes across a variety of psychopathology vulnerabilities. This involved the comparison of the mean scores of class status on emotion reappraisal, emotion suppression, positive affect, negative affect, and anxiety sensitivity. The modified Bolck, Croon and Hagnaars (BCH; Bolck, Croon, & Hagnaars, 2004) method was used to compute the means of these psychopathology vulnerabilities that are associated with the classes (Bolck, Croon, & Hagnaars, 2004). The BCH method involves (i) estimation of the LCA model; (ii) assignment of weight to class membership, and; (iii) correction of classification error using the weights assigned in step 2. Based on this procedure, the BCH treats the latent classes as multiple groups and thereby avoids class shifts (Asparouhov & Muthén, 2015). The results of the analysis

revealed that there were significant differences in means between the classes such that individuals in the low-DERS class experienced higher levels of emotion reappraisal and positive affect relative to the high-DERS class, indicating that low-DERS class status presents relatively less risks for psychopathologies. Comparatively, individuals in the high-DERS class experienced higher levels of emotion suppression, negative affect, and anxiety sensitivity concerns, indicating that high-DERS class status presents relatively more risks for psychopathology. The results demonstrated that emotion regulation class status correctly distinguished psychopathology vulnerabilities, and thus establishing the construct and discriminant validity of the model. See Table 19 for detailed results.

### **Validity of the Factors**

The construct validity of the six factors of emotion regulation problems was tested by examining their associations with psychopathology vulnerabilities of negative affect, positive affect, and anxiety sensitivity. The associations were tested by running bivariate correlations among the six factors and psychopathology vulnerabilities. The results of the associations are provided in table 20. All the six factors were negatively associated with positive affect and positively associated with negative affect and anxiety sensitivity, indicating the discriminant and convergent validities of the factors.

### **Hypothesis 2: Test the Measurement Invariance of the Model (2-Class, 6 Factors) Across Groups based on Age, Sex, and Ethnicity.**

Measurement invariance of the hybrid model (2-class, 6 factors) was tested across diverse groups of the population based on sex, age, and ethnicity. Measurement invariance helped to determine whether the different groups interpret the items of emotion regulation difficulties the same way. The groups were compared at four levels of invariance (configural, metric, scalar, and

strict), using measures of goodness of fit such as AIC, BIC, aBIC, and entropy value (Horn & McArdle, 1992; Saris, Satorra, & Van der Veld, 2009).

Configural invariance indicates that the latent structure of the model is similar across the groups (Meredith & Teresi, 2006). For this study, it tested whether items of the model loaded on the same latent factor across the groups. It was determined by freely estimating factor loadings, intercepts, and residual variances of the model. Metric invariance tested whether the unit and levels of the latent factor of the model were the same across the groups (Meredith & Teresi, 2006). This involved fixing the factor loading of model across the groups while freely estimating item means and covariances allowing for comparison of the items' correlations and factor means of the model across the groups (Asparouhov & Muthén, 2014a, 2014b). Scalar invariance tested whether item intercepts and factor loadings of the model were the same across groups. Finally, strict invariance tested whether the residual variance of the items, in addition to factor loadings and intercepts, was similar across the groups. Strict invariance indicates that the differences between the groups are due to true differences in the population (Sass & Schmitt, 2013). All the groups were examined for the four levels of measurement invariance.

The results of the analysis indicated that the model achieved strict invariance for the sex and ethnicity groups, indicating that there were no significant differences in the function of the hybrid model in the population based on sex and ethnicity. The fit indices for the strict invariance for the sex and ethnicity groups are reported in tables 21 and 23. On the other hand, the invariance of the model in the population based on age was scalar (see Table 22). Even though the strict invariance is considered the most restrictive, scalar invariance is considered sufficiently restrictive for equitable comparison of groups (Meredith & Teresi, 2006). Based on these levels of invariance achieved, the results suggest that there are no significant measurement

differences in the level of emotion regulation difficulties across the groups. This suggested that emotion regulation difficulties in the groups can be quantitatively and meaningfully compared.

### **Hypothesis 3: Examine Effects of Covariates (Age, Sex, Ethnicity, Education and Adverse Life Events) on Class Membership**

The effect of the five covariates – sex, age, ethnicity, education, and adverse life events - on class membership was examined using the three-step method (R3STEP) for predicting latent class variables in mixture models. The R3STEP was used for this study because when the covariates were directly included in the model a significant distortion of the unconditional model resulted, leading to incorrect class membership probabilities. The distortion of the unconditional model indicates a potential for confounding in the meaning and definition of the class membership (Asparouhov & Muthen, 2014). Based on this reason the R3STEP was used to examine the effects of covariates as it maintains them as auxiliary or external to the unconditional (focal) model (Asparouhov & Muthen, 2014). Treating covariates as auxiliary variables in mixture models has been shown to prevent a shift in the structure and definition of the factor and class solution because it accounts for the measurement error in the latent class membership (Lanza & Rhoades, 2013; Lanza, Tan, & Bray, 2013), and thus preserving the integrity of the unconditional model.

The results of the analysis indicated an increase in age and education was associated with low-DERS class ( $p < 0.01$ ). Overall, an increase in age by one year was approximately associated with a 10% increase in the probability of being in the low-DERS class, whereas an increase of one year in the level of education was also significantly associated with approximately 20% probability of being in the low-DERS class. However, adverse life events were significantly

associated with high-DERS class ( $p < 0.01$ ). A unit decrease in the number of adverse life events was associated with approximately 10% decrease in the probability of being in the high emotion regulation problems class. See Tables 24 and 25 for details.

### **Between-Class Differences in the Levels of Emotion Regulation Problems**

The BCH approach was used to estimate the mean differences in the severity of emotion regulation problems across the classes. The BCH is a three-step approach for modeling distal outcomes in mixture models that involves estimation of the LCA model, assignment of weights to the class membership, and the use of the weights estimated to correct class classification errors (Bakk & Vermunt, 2016; Bolck et al., 2004; Kim, Vermunt, Bakk, Jaki, & Van Horn, 2016; Vermunt, 2010). The BCH was used in the study to ensure that the estimation of class mean differences in the unconditional model did not cause a shift in the final solution as it assumes no measurement error in the latent class membership in its assignment of weight. This ensures correction of any class classification error (Asparouhov & Muthen, 2014; Bakk & Vermunt, 2016). The results of the analysis of the mean differences between the classes are presented in table 26.

Comparisons of scores in the six domains of emotion regulation difficulties indicated significant differences across classes such that individuals in the high-DERS class had higher scores in all six domains. The overall differences between the level of emotion regulation difficulties between the classes was significant at  $\chi^2(1) = 1252.34, p < 0.001$ , indicating that individuals in the high-DERS class experienced substantially more problems in emotion regulation.

## **Effect of Class Membership on Severity of Psychopathology Symptoms**

The effects of class membership on severity of psychopathology symptoms were tested using the BCH approach in which covariates and distal outcomes were estimated as auxiliary variables. The conditional model with covariates was manually set up using the BCH three-step estimation approach. The set up involved two separate runs. The first run involved the estimation of the measurement model (LCA) using only the latent class indicator variables and saving the BCH weights together with the symptoms of psychopathology and covariates. In the second run, the saved data file was retrieved for the final analysis. To estimate the differences in symptoms of psychopathology, class status was used as the independent variable while symptoms of depression, anxiety, and borderline personality disorder were used as the dependent variables. The results of the means differences in psychopathology symptoms are shown in Table 27. The results revealed that individuals in the high-DERS class exhibited significant higher levels depression, anxiety, and borderline personality disorder symptoms, as compared to the individuals in low-DERS class.

## **Distinguishing Psychopathology Symptoms**

The hybrid model was used to differentiate psychopathology symptoms using their underlying dimensions and categories. Specifically, the first approach involved differentiation of the disorder symptoms based on their underlying vulnerabilities of emotion regulation difficulties (nonacceptance, goals, impulsiveness, awareness, clarity, strategy), while the second approach involved differentiation of the disorder symptoms in terms of level of severity (i.e., high-DERS and low-DERS). The BCH and DCAT approaches of mixture modeling (in Mplus) were employed to assess which of these approaches for differentiating psychopathology provided the best information that could be utilized for understanding disorder symptoms.

## **Differentiation of psychopathology symptoms based on underlying vulnerability**

The BCH approach was used to distinguish the symptoms associated with depression, anxiety, and borderline personality disorder, based on their underlying vulnerability of emotion regulation difficulties. The outcome produced within- and between-class differences.

### **Results for differences between the classes:**

Between the classes, the results of the analysis indicated that nonacceptance of emotional response was negatively associated with anxiety symptoms in the low emotion regulation class (low-DERS) and positively associated with depression and borderline personality disorder symptoms in high emotion regulation class (high-DERS). Difficulty engaging in goal-directed behavior was positively associated with anxiety, depression, and borderline personality disorder symptoms in both low- and high-DERS classes; however, the degree of association was higher in the high-DERS class relative to the low-DERS class. Impulse control problem was positively associated with symptoms of depression and anxiety in both classes, while it was associated with borderline personality disorder symptoms in the high-DERS class. Lack of emotional awareness was positively associated with borderline personality disorder symptoms in the high-DERS class and negatively associated with depressive symptoms in the high-DERS class. Lack of emotional clarity was positively associated with depression, anxiety, and borderline personality disorder symptoms in the high-DERS class. Finally, limited access to emotion regulation strategies was positively associated with depression and borderline personality disorder symptoms in both classes and positively associated with anxiety symptoms in the high-DERS class.



The results highlight that using the underlying vulnerability of psychopathology to differentiate symptoms provides a clear delineation of risk factors associated with the disorders, and thus offering substantial clinical information for their treatments.

**Results for differences within the classes:**

Analysis of the results of the differences in psychopathology symptoms within the classes indicated that within the low-DERS class depressive symptoms were positively associated with difficulties engaging in goal directed activities, impulse control difficulties, and limited access to emotion regulation strategies. Within the high-DERS class, depression symptoms were positively associated with nonacceptance of emotional responses, difficulties engaging in goal directed behaviors, impulse control difficulties, lack of emotional clarity, and limited access to emotion regulation strategies. However, within the high-DERS class, depression symptoms were negatively associated with lack of emotional awareness.

For anxiety symptoms, low-DERS class was positively associated with difficulty engaging in goal directed activity and impulse control difficulties. However, anxiety symptoms were negatively associated with non-acceptance of emotional responses. Within the high-DERS class, anxiety symptoms were positively associated with nonacceptance of emotional responses, difficulty engaging in goal-directed behavior, impulse control difficulties, and lack of emotional clarity.

For borderline personality disorder symptoms, low-DERS class was positively associated with difficulty engaging in goal-directed behavior and limited access to emotion regulation strategies, while high-DERS class was positively associated with difficulty engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, lack of emotional clarity, and limited access to emotion regulation strategies. However, high-DERS class was

negatively associated with nonacceptance of emotional responses. Detailed results are provided in Table 28.

### **Differentiation of Psychopathology Symptoms based on Categories of Symptom Severity**

The DCAT, a mixture model approach for examining categorical distal outcomes, was used to conduct multinomial logistic regression analyses to estimate the probability of experiencing psychopathology symptoms based on severity of symptom categories in the low-DERS and high-DERS classes. The DCAT is an auxiliary procedure that prevents covariates and categorical outcome variables from influencing the structure and profiles of the unconditional model (Lanza & Rhoades, 2013; Lanza et al., 2013). The DCAT was used for the analysis because it has demonstrated the ability to preserve the profile of categorical outcomes without causing a shift to the parameters in the unconditional model (Muthen & Muthen, 2017). The results of the analyses are presented in Tables 29 - 31.

The model, drawing on categories of symptoms severity to classify disorders, converged successfully when distinguishing symptoms in the low-DERS class for all psychopathology symptoms. For example, the probability of experiencing clinically significant symptoms of depression was 0.25 for mild symptoms, 0.12 for moderate symptoms, and 0.02 for severe symptom. For anxiety, the probabilities were 0.34 for mild symptoms, 0.18 for moderate symptoms, and 0.07 for severe symptoms. Additionally, the experiences of clinically significant symptoms of borderline personality disorder were associated with 0.12 probability. However, the model failed to converge when predicting the probability of experiencing clinically significant symptoms of psychopathology in the high-DERS.

The overall results of differentiating psychopathology symptoms indicated that information provided using the underlying vulnerabilities was both statistically interpretable and

clinically meaningful. However, the results obtained using the categories of symptom severity provided some amount of meaningful and interpretable information for the low-DERS class, but the model failed to successfully provide clinically useful information for predicting disorder symptoms in the high-DERS class.

## CHAPTER 4

### DISCUSSION

The present study applied an exploratory framework to investigate the functional transdiagnostic mechanisms of emotion regulation difficulties in psychopathology symptoms. Specifically, the study explored the structure of emotion regulation difficulties using latent profile analysis, factor analysis, and exploratory factor mixture modeling.

Consistent with the main hypothesis of the study, the overall best fitting model of the structure of emotion regulation difficulties was a hybrid model, consisting of a categorical structure of two profiles and a dimensional structure of six factors. The categorical structure suggested that across the population two profiles of emotion regulation difficulties are apparent. There is a high-DERS class and a low-DERS class, with the high-DERS class presenting significantly more risks for experiencing anxiety, depression, and borderline personality disorder symptoms. The two profiles of emotion regulation difficulties obtained in this study (i.e., high-DERS and low-DERS classes) did not align with the results from other studies that had explored the categorical structure of emotion regulation difficulties. For example, Peterson et al., (2019) identified four profiles of emotion regulation difficulties in relation to non-suicidal self-injury (NSSI) population, by focusing on a select group of individuals in the population that endorsed lifetime non-suicidal self-injury. The profiles of emotion regulation difficulties identified in their study were (1) moderate emotion regulation difficulties with elevated frequency of cutting and burning behavior (2) a high emotion regulation difficulties with elevated frequency of scratching/skin piercing behaviors and low levels of using implements (3) moderate levels of

emotion regulation difficulties with elevated scratching/skin piercing behaviors and low levels of using implements, and (4) low emotion regulation difficulties with low frequency of all NSSI types (Peterson, Chen, Karver, & Labouliere, 2019). In another study combining Gross's Process Model of emotion regulation problems (Gross, 2003; 2014) and competency-based model of emotion regulation difficulties (Gratz & Roemer, 2004), three profiles of emotion regulation difficulties were extracted in relation to experiences of affective disorder-related symptoms (de Carvalho Braule Pinto, Pasian, & Malloy-Diniz, 2022). The profiles were (1) frequent use of cognitive reappraisal and low levels of emotion dysregulation (2) some use of cognitive reappraisal and high level of difficulty in becoming aware of one's emotions, and (3) less frequent use of cognitive reappraisal and high levels of emotion dysregulation. A third study by Specker & Nickerson (2019) that studied a population of refugees who had been exposed to trauma identified three distinct profiles of emotion regulation difficulties. The profiles were (1) high regulators, involving individuals that tend to be high in trait reappraisal and high in trait suppression in their responses to emotion eliciting stimuli, (2) adaptive regulators, involving individuals that are high in trait reappraisal and moderate in trait suppression in their emotional responses, and (3) maladaptive regulators, involving individuals that are low in trait reappraisal and high in trait suppression.

The discrepancies in the profiles of emotion regulation difficulties observed in these studies could stem from a number of factors, including differing population characteristics and the nature of the measure of emotion regulation difficulties used. While the current study focused on students and the general population, the other studies examined profiles of emotion regulation difficulties in an adult population (de Carvalho Braule Pinto, 2022), a select population with a known history of non-suicidal self-injury (Peterson et al., 2019), and trauma exposed refugees

(Specker & Nickerson, 2019). The differing demographic characteristics and clinical differences in the responses of the populations might have resulted in the distinct profiles that were enumerated. Additionally, the present study used a measure of emotion regulation difficulties that had been developed based on the competency-based model (i.e., DERS). However, the other studies had employed measures that had been developed based solely on the process-based model (i.e., Emotion Regulation Questionnaire- ERQ) or a combination of items from both the process-based and competency-based models of emotion regulation (i.e., DERS and ERQ). Even though current study attempted to combine items from measures based on both the process-based and competency-based models, the differential discrepancies in the scales of the measures and overlapping contents of items of the measures made it statistically and practically infeasible to implement. This led to the selection of DERS because its content subsumes the item content of the ERQ. Another potential source of discrepancy might be due to the methods used to explore the profiles. In fact, the current study used a more robust approach that simultaneously extracted both the dimensional and categorical profiles of emotion regulation difficulties. However, the other studies used a standalone categorical approach (latent profile analysis) to extract the profiles of emotion regulation difficulties in the population. The application of factor-mixture model is considered most appropriate in these situations where strong floor effects and unobserved population heterogeneity exists in the data (Kim & Muthén, 2009). This is because it addresses the problems of strong floor effect by decomposing the data into dichotomous and continuous response components, allowing exploration of unobserved differences in the population.

Even though there are variations in the number of profiles of emotion regulation difficulties identified in these studies, each of these enumerated profiles indicates specific

association between emotion regulation difficulties and symptoms of psychopathology, with individuals in the more maladaptive regulation profiles exhibiting more symptoms of emotion dysregulation and psychiatric symptoms.

The low-DERS and high-DERS profiles enumerated in the current study represent population heterogeneity in emotion regulation difficulties within the general population. These differences in the population, as observed in the study, could stem from general predispositional and learning models of emotion regulation difficulties. Predispositionally, presentation of emotion regulation difficulties suggests a heritable and stable trait resulting from neurobiological vulnerability, such as dopaminergic dysfunction. For example, in studying heterotypic continuity associated with externalizing disorders, they suggested that heritable trait impulsivity indicating mesolimbic dopaminergic dysfunction interacts with biological and environmental factors to lead to diverse disorders, such as oppositional defiant disorder, substance dependence, and conduct disorder (Beauchaine & McNulty, 2013). This phenomenon is also consistent with the generalized biological vulnerability in the triple vulnerability theory of psychopathology (Suárez, Bennett, Goldstein, & Barlow, 2009). According to this theory, emotion regulation difficulties present as context-related vulnerabilities resulting from reinforcement of affective states that evolve over time and develop into trait-like susceptibility for developing psychopathology ((Beauchaine, 2015; Beauchaine & McNulty, 2013; Hinshaw, 2015). On the other hand, learning or behavioral conceptualization of emotion regulation difficulties suggests that there are more socialized deficiencies in emotion regulation difficulties, which result in increases or decreases in responses to consequences of emotion eliciting situations. This conceptualization is consistent with the generalized psychological vulnerability in the triple vulnerability theory of psychopathology (Suarez et al., 2009).

Thus, the hybrid model of emotion regulation difficulties suggests that there are two paths for individuals classified as high-DERS: individuals who inherit elevated DERS, as well as individuals who acquire elevated DERS through learning or socialization. In a broader sense, emotion regulation difficulties seem to present as a dynamic process that presents risk for psychopathology through heritable, socialization, and learning processes. Specifically, a key tenet to such a theory is that individuals who inherit elevated DERS remain stable in the high DERS group, whereas those who acquire elevated DERS through learning show an increase in DERS over time. Whereas more studies exploring the longitudinal stability of the DERS classes are needed, the results of the current study point to a hybrid predisposition/learning model of DERS rather than an orthodox predisposition or learning model.

The dimensional structure of emotion regulation difficulties suggests that within the high-DERS and low-DERS classes the severity of psychopathology symptoms vary along six distinct dimensions of emotion regulation difficulties. The six dimensions of emotion regulation difficulties are (1) nonacceptance of emotional responses (NONACCEPTANCE), reflecting propensity to respond negatively to distressing emotional experiences; (2) limited access to emotion regulation strategies (STRATEGIES), reflecting poor belief in ability to effectively manage negative emotional experiences; (3) lack of emotional awareness (AWARENESS), indicating difficulties in attending to and recognizing emotional experiences; (4) impulse control difficulties (IMPULSIVITY), indicating difficulties in controlling one's emotional responses in the midst of experiencing negative emotions; (5) difficulties engaging in goal-directed behaviors (GOALS), reflecting problems in focusing and completing activities when experiencing negative emotions; and (6) lack of emotional clarity (CLARITY), indicating limited ability in detecting and distinguishing negative emotional experiences. These dimensions are consistent



with the multidimensional model of emotion regulation difficulties (Gratz & Roemer, 2004; Kring & Sloan, 2009). The study results further highlighted the specific risks posed by each dimension of DERS, as seen in their differential roles in the presentation of anxiety, depression, and borderline personality disorder symptoms.

Specifically, nonacceptance of emotional responses dimension was associated with symptoms of anxiety and depression in both low- and high-DERS classes, with the high-DERS class exhibiting significantly greater symptoms. This is consistent with studies that have explored the influence of nonacceptance of emotional responses in anxiety and mood disorder-related symptoms (Plate, Aldao, Quintero, & Mennin, 2016; Salters-Pedneault, Roemer, Tull, Rucker, & Mennin, 2006). For example, Borkovec's theory of anxiety indicates that individuals employ nonacceptance strategies, such as avoidance of unwanted emotions and worry, to circumvent the physiological arousal that typically cooccur with the experience of distress. This is because it helps to temporarily reduce the impact of secondary emotions, such as shame, irritability, embarrassment, and guilt, that characterize the primary reaction to negative emotions (Borkovec, 1994; Borkovec, Alcaine, & Behar, 2004; Roemer et al., 2009). By circumventing the experiences of negative emotions, however, individuals fail to identify, label, express, and manage their emotions, leading to excessive worry and rumination (Aldao, Jazaieri, Goldin, & Gross, 2014; Soenke, Hahn, Tull, & Gratz, 2010). Additionally, nonacceptance strategies such as distraction, experiential avoidance, and suppression interfere with the with the utilization of adaptive responses, such as cognitive reappraisal and attentional control (Borkovec & Roemer, 1995; Liverant, Brown, Barlow, & Roemer, 2008). As a result, these strategies negatively impact the attention, memory, and cognitive control that are required in dealing with the negative

emotions associated with anxiety and depression, often leading to symptoms exacerbation (Gotlib & Joormann, 2010; Joormann & Vanderlind, 2014).

Difficulties engaging in goal-directed behavior dimension was positively associated with anxiety, depression, and borderline personality disorder symptoms in both low- and high-DERS classes, with individuals in the high-DERS class experiencing greater symptoms across all the disorders. Consistent with other studies, difficulty engaging in goal-directed activities is noted to be one of the predominant factors in the episodes of anxiety, depression, and borderline personality disorder (Martin-Soelch, Linthicum, & Ernst, 2007; Nestler & Carlezon Jr, 2006). It is indicated that effective engagement in goal-directed behaviors requires integration of knowledge of the consequences of an action and the value associated with the resulting outcome (Gillan, Kosinski, Whelan, Phelps, & Daw, 2016). Therefore, understanding the consequences of the goal-directed behavior and the values associated with those consequences are critical for selecting the course of action. As a result, deficiency in forming goal-directed behaviors results in an inability to integrate actions and outcomes appropriately, resulting in limited capacity to respond adaptively to negative emotional experiences (Balleine & Dickinson, 1998; Voon et al., 2015). This leaves individuals vulnerable to rely excessively on forming automatic, rigid, and dysregulated behaviors when experiencing negative emotions. The reliance on these rigid and dysregulated behaviors lead to difficulties in focusing, concentrating, and problem-solving that are seen in the symptoms of anxiety and depression (Voon et al., 2015). Additionally, these maladaptive behaviors, contributing to reduction in goal-directed control, lead to poor behavior regulation and compulsiveness that manifest in over-indulgence in pleasurable activities that characterize with borderline personality disorder (Bayes, Parker, & McClure, 2016).

Impulse control difficulties dimension was positively associated with the symptoms of depression, anxiety, and borderline personality disorder in both high- and low-DERS classes, with individuals in the high-DERS class expressing greater vulnerabilities for experiencing psychopathology symptoms associated with anxiety- and mood-related disorders. Similar results have been found in other studies (Marmorstein, 2013; Moeller, Barratt, Dougherty, Schmitz, & Swann, 2001). Impulse control difficulties involve the tendency to engage in “rapid, unplanned reactions to internal and external stimuli without regard to negative consequences of those reactions” (Moeller et al. 2001, p. 1784). These difficulties have been divided into three categories; attentional impulsiveness, motor impulsiveness, and non-planning impulsiveness (Carver & Johnson, 2018). Attentional impulsiveness involves difficulties focusing on task and experiencing racing thoughts that interfere with adaptive emotional responses. Motor impulsiveness, on the other hand, involves difficulties associated with the tendency to act on the spur of the moment and engage in thinking and behaviors that are inconsistent over time. Finally, non-planning impulsiveness is related to difficulties associated with acting without planning and aversiveness to engage in future and complex thinking (Muhtadie, Johnson, Carver, Gotlib, & Ketter, 2014). Attentional and non-planning impulsiveness are implicated in depressive and anxiety symptoms in which poor attention, rapid cognitive decisions, rumination, and low tolerance for cognitive challenges and distress are deployed in reaction to negative emotion. The deployment of these maladaptive responses results in impaired response inhibition, neuroticism, negative affectivity, and impaired regulation ability (Fossati, Gratz, Maffei, & Borroni, 2014; Wray, Simons, Dvorak, & Gaher, 2012). Non-planning and motor impulsivity are linked to reward sensitivity that is implicated in the tendency to engage in intense emotional responding that is observed in borderline personality disorder.

Overall, the inattentive, motor, and non-planning difficulties associated with the impulsivity dimension lead to poor attention, low tolerance for distress, and poor decision making, which result in impaired response inhibition, neuroticism, negative affectivity, and impaired regulation that characterize psychopathology symptoms.

Deficits in emotion awareness dimension were positively associated with the symptoms of depression and borderline personality disorder, and this was more predominantly observed in the high-DERS class. As seen in other studies, deficits in emotional awareness have been indicated to underlie the misjudgments, poor personal and interpersonal decisions, and rigid beliefs that characterize symptoms of depression and borderline personality disorder (Kuo, Khoury, Metcalfe, Fitzpatrick, & Goodwill, 2015; Linehan, 2018; Lischetzke, Cuccodoro, Gauger, Todeschini, & Eid, 2005). This is because emotion awareness is required not only for understanding personal emotional experiences but also emotional experiences of others in the social environment (Greenberg, 2004; Lane & Schwartz, 1987). Therefore, effective use of emotion awareness is needed to regulate appropriate responses to internal and environmental signals needed to adaptively modulate emotional responses (Stegge & Terwogt, 2007). Adaptive modulation of emotional responses requires effective understanding of the emotion eliciting stimuli needed for the comprehension of the source of the stimuli, as well as the cognitive attributions that are assigned to the emotion source (Kuppens, 2013). This means unique information can be comprehended and cognitively represented in various ways, depending on the level of awareness of the source and type of emotion experienced. Deficit in emotion awareness has been associated with minimal evaluation and elaboration of the emotion source and type, during which maximal attention is deliberately directed away from the information eliciting stimuli (Richards & Gross, 2000). The deliberate misdirection of attention away from the

emotion eliciting stimuli often result in biases in the memory of emotional experiences, voluntary inattention, and a lack of flexible approach to understanding and interpreting information (Lischetzke et al., 2005; Nitschke, Heller, Imig, McDonald, & Miller, 2001). In general, deficits in the dimension of emotion awareness manifest in misjudgments in emotional responses, poor personal and interpersonal decisions, and rigid approach to processing information, leading to maladaptive regulation of internal and environmental stimuli and cognitive biases in the high-DERS group that result in the symptoms of depression and borderline personality disorder.

Lack of emotional clarity dimension was positively associated with depression and borderline personality disorder symptoms only in the high-DERS class. Similar study has implicated deficits emotional clarity in diverse mood-related disorders, including depression, bipolar disorder, and borderline personality disorder (Westbrook & Berenbaum, 2017). Deficits in emotional clarity manifest in limited ability in identifying and labeling emotions and modulating the valence, intensity, and duration of emotions, which negatively affect adaptive responding to environmental stimuli (Gross, 1998). This is because deficits in emotional clarity make self-regulatory and other cognitive responses more taxing, causing difficulties in differentiating affects, impulsive behaviors, poor arousal discrimination, malfunctioning arousal processes, and poor attentional control (Lischetzke & Eid, 2003; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). For example, according to the theory of emotional cascade, individuals experiencing difficulties in clarifying emotions ruminate intensely on the distressing emotions, misinterpret physiological reactions, and engage in dysregulated or impulsive behavior as a means of distracting from experiencing the intense emotion (Tomko et al., 2015; Zaki, Coifman, Rafaeli, Berenson, & Downey, 2013). The attempt to distract from the emotion eliciting stimuli

leads to increased negative affects, which manifest in interpersonal difficulties, non-suicidal self-injury, and increased alcohol use that are predominantly (Tomko et al., 2015; Zaki et al., 2013). Overall, poor emotional clarity is implicated in the symptoms of depression and borderline personality in the high-DERS class as it burdens the ability to identify, label, and modulate emotion eliciting stimuli, making it more taxing to implement self-regulatory and adaptive cognitive responses when experiencing distress.

Finally, limited access to emotion regulation strategies dimension was positively associated with depression, anxiety, and borderline personality disorder symptoms in both classes, with the high-DERS class conferring greater risk for developing more psychopathology symptoms. Maladaptive emotion regulation strategies have been widely implicated in affective disorders, especially anxiety and depression (Aldao & Nolen-Hoeksema, 2012; Daros & Williams, 2019). Examples of emotion regulation strategies are cognitive reappraisal, problem solving, and expressive expression, rumination and expressive suppression (Aldao et al., 2010). These strategies constitute a regulatory process that can alter the characteristics of emotional responses (Aldao, 2012; Gross & Thompson, 2007). For example, cognitive reappraisal is associated with increased positive affect, positive social relationships, social support, and general psychological well-being (Carver, Scheier, & Weintraub, 1989; Ryff & Keyes, 1995; Watson, Clark, & Carey, 1988). Emotion suppression is involved in an inhibition of emotion expressive behaviors (Gross, 2001; Gross & John, 2003), and it is associated with biases in memory of emotional experiences, voluntary attention, and poor understanding of emotions (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Gross, John, & Richards, 2000). Overall, limited access to emotion regulation strategies lead to deficits in accessing, selecting, and implementing adaptive responses that are needed for appraising emotion eliciting stimuli, problem solving, and

adaptive emotional responding. These deficits result in poor understanding of emotions and inhibition of expressive behaviors that are associated with anxiety, depression, borderline disorder across the population.

The study further examined the consistency of emotion regulation difficulties across populations. Consistent with the study hypothesis, the results indicated that the FMM-3 variation of the 2-class, 6 factors model was the best fitting model for the data, indicating that the differences in the classes are attributed to variation in the individual responses to the items. This means that the observed differences in the two classes were due to unique individual characteristics of the population, while the six factors indicated presence of heterogeneity within the classes. Conceptually, the FMM-3 makes sense because the invariant factor loadings across the classes suggest that the differences between the population are due to differences in responses to the observed items rather than differences in the underlying dimensions of emotion regulation difficulties. The within-class differences are attributable to differences in the levels of the dimensions of emotion regulation difficulties. These observations confirmed the existence of distinct low-DERS and high-DERS classes, as well as the six dimensions of emotion regulation difficulties.

Also consistent with the study hypothesis, assessment of the measurement invariance of the hybrid structure yielded a strict invariance for the groups based on sex and ethnicity, providing support that there are no significant differences in the experiences of emotion regulation difficulties across the population based on sex and ethnicity. This means the experiences of emotion regulation difficulties are consistent and can be quantitatively and meaningfully compared across individuals of different sexes and ethnicities. Other studies examining the measurement invariance of emotion regulation difficulties also found equivalent

results across all sexes and ethnic groups (Preece et al., 2021; Ritschel, Tone, Schoemann, & Lim, 2015).

However, the examination of the equivalence of difficulties in emotion regulation in the populations based on age and education indicated that an increase in age and education was positively associated with the probability of experiencing less difficulties in emotion regulation. This finding was inconsistent with the study hypothesis, which had postulated that experiences of emotion regulation would be similar across groups irrespective of age and education. These results are similar to those seen in a study examining differences in emotion regulation problems between young and older adults, which found that older adults exhibit greater ability in adaptively regulating their emotions (Orgeta, 2009). Further evidence suggests age-related reduction in responsiveness to negative emotion (Allemand, Zimprich, & Hertzog, 2007; Jorm, 2000). For example, it has been postulated that an increase in age leads to decreases in neuroticism, and that older adults are able to anticipate and adapt well to negative affect more than younger adults (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Costa & McCrae, 1988). Similarly, longitudinal research suggest decreases in negative affects with aging, with older adults reporting less experiences of negative affects and more adaptive coping (English, John, Srivastava, & Gross, 2012; Gross & John, 2003; Urry & Gross, 2010). An increase in age has been linked to reduced emotion-specific nervous system activity, arousal levels, and related physiological responses to negative emotion (Levenson, Carstensen, Friesen, & Ekman, 1991; Mauss, Cook, Cheng, & Gross, 2007; Tsai, Levenson, & Carstensen, 2000). Additionally, differences in emotion regulation difficulties are influenced by verbal ability, with individuals possessing higher education exhibiting greater adaptive control, suggesting that as individuals increase in age (experience) and gain more education (knowledge) they become more adept at



adaptively regulating their emotions in response to both personal and environmental stressors (Ortega, 2009).

In summary, the present study has described an intersecting set of emotion regulation difficulties diathesis significant in the experiences of anxiety- and mood-related disorder symptoms. Consistent with the triple vulnerability theory of emotional disorders (Barlow, 2000; Suárez et al., 2009), the study identified two profiles of emotion regulation difficulties in the population constituting a generalized biological and psychological vulnerability that are represented in the two classes of emotion regulation difficulties – low-DERS class and high-DERS class. The generalized biological and psychological vulnerabilities reflect non-specific genetic/learning contributions to the development and experiences of psychopathology symptoms (Gee & Payne-Sturges, 2004; Payne, Ellard, Farchione, Fairholme, & Barlow, 2014). The other diathesis is a specific psychological vulnerability of emotion regulation difficulties that is constituted in the six underlying vulnerabilities of psychopathology symptoms: nonacceptance of negative emotional experiences, lack of emotional clarity, lack of emotion awareness, limited emotion regulation strategies, impulsivity, and lack of goal-directed behaviors in responding to negative emotions. These six specific psychological vulnerabilities lead to the differences in psychopathology symptoms that are observed within the population. However, relationships among these distinctive dimensions of emotion regulation difficulties indicate substantial overlap and represent a common diathesis of psychological vulnerability in the experiences of anxiety- and mood-related disorder symptoms.

### **Study Limitations and Directions for the Future**

The study was primarily exploratory, as a result the generalizability of the results is limited in terms of how the model could be used or applied meaningfully in the real-world

settings. Future studies should involve data that could be split into an exploratory and confirmatory dataset, and the best-fitting models in the exploratory set are compared and validated against clinically relevant variables in the confirmatory set. The results would confirm whether individuals could be grouped into latent classes that are clearly distinguishable on emotion regulation difficulties and psychopathology symptoms.

The study was survey-based and cross-sectional, which limited understanding of the trajectory of psychopathology symptoms and emotion regulation difficulties. Studies exploring the longitudinal stability of the DERS classes are needed to determine the variations in the trajectory of emotion regulation difficulties and how that relates to the experiences of psychopathology symptoms.

Because symptoms were assessed via self-report only (no clinical interviews were conducted), the study was unable to determine the extent of true psychopathology in the present sample. As such, the sample may not represent a particularly dysregulated group of individuals, even though we had a broad spectrum of scores ranging from 37 to 173 out of a total score of 180. The mean score was 98.5. Thus, broader testing of measurement invariance in diverse clinical samples is warranted. This limitation is particularly relevant given that the difficulties in emotion regulation is often used as an index of psychological impairment.

## **Conclusions**

The study explored emotion regulation difficulties as a functional transdiagnostic construct underlying psychopathology symptoms using factor mixture modeling. The study examined the factor structure and measurement invariance of emotion regulation difficulties, as well as the relations between emotion regulation difficulties and psychopathology symptoms.

Consistent with the study hypothesis, the analysis indicated that a hybrid structure of emotion regulation difficulties as the best fitting model. The categorical structure consisted of two classes of emotion regulation difficulties – low-DERS and high-DERS classes - across the population, while the dimension structure suggested six factors of emotion regulation difficulties that varied within the two classes. The class status differentially predicted presentation of anxiety, depression, and borderline personality disorder symptoms, even after controlling for education, age, and adverse life events. Specifically, the results revealed greater probability of presenting at least one current symptom of anxiety, depression, and borderline personality disorder in the high-DERS class compared to the low-DERS class. The dimensions of emotion regulation difficulties suggested that within the high- and low-DERS classes, variations in the severity of psychopathology symptoms occurred based on six distinct factors. The six factors are nonacceptance of emotional responses, limited access to emotion regulation strategies, lack of emotion awareness, impulsivity, difficulties engaging in goal-directed activities, and lack of emotional clarity. Elevated levels of the six factors within the classes lead to the high rates of comorbidity among depression, anxiety, and borderline personality disorder symptoms.

The study provides evidence for emotion regulation difficulties as a functional transdiagnostic construct in psychopathology, as it demonstrates the underlying mechanism of the enormous heterogeneity within the symptoms of disorders and shows that many different sequelae of underlying risk factors can be combined to constitute disorder symptoms. The hybrid structure of emotion regulation indicates that disorder symptoms vary between individuals and also morph across other psychosocial factors, such that individuals presenting the same risk factors can present diverse functional impairments across situations and time. For example, adverse life events and personality factors were identified as nonspecific risk factors that

significantly influence symptoms associated with depression, anxiety, and borderline personality disorder. These findings explicitly challenge the assumption that symptoms of disorders are influenced by distinct and categorical factors. The results from this study clearly indicate that conceptualizing disorders based on their underlying etiology would yield more valuable information, as it highlights the functional liabilities in disorder symptom presentation. Thus, the study has established a framework for explaining the structure of disorder etiology, rampant disorder comorbidity, frequent symptoms heterogeneity within disorders, and non-specificity of disorder symptoms.

Overall, the study results provide support for existing literature suggesting a stepping back from individual DSM diagnostic category and associated disorder-specific diagnosis and treatment and considering a more transdiagnostic approach based on the underlying vulnerabilities of psychopathology. Even though, the DSM-5 highlights a splitting approach to nosology (APA, 2013), there exists a plethora of emerging evidence (Brown & Barlow, 2009; Payne et al., 2014), including results found in the current study, which provide support for a transdiagnostic diathesis of psychopathology symptoms. The evidence further highlights that the current diagnostic system may be indicating categories that are minor variations of more fundamental underlying vulnerabilities, and that it would be best to understand psychopathology symptoms as constructs that emerge as blips on a general background of undergirding risk factor.

## LIST OF REFERENCES

## LIST OF REFERENCES

- Abbey, A., Smith, M. J., & Scott, R. O. (1993). The relationship between reasons for drinking alcohol and alcohol consumption: An interactional approach. *Addictive behaviors, 18*(6), 659-670.
- Abramovitch, A., Abramowitz, J. S., & Mittelman, A. (2013). The neuropsychology of adult obsessive–compulsive disorder: a meta-analysis. *Clinical psychology review, 33*(8), 1163-1171.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological review, 96*(2), 358.
- Akram, F., Kawa, S., & Giordano, J. (2017). Diagnosis in American psychiatry: a brief history of the diagnostic and statistical manual. In *Handbook of DSM-5 disorders in children and adolescents* (pp. 3-15): Springer.
- Aldao, A. (2012). Emotion regulation strategies as transdiagnostic processes: a closer look at the invariance of their form and function= Estrategias de regulación emocional como procesos transdiagnósticos: una visión más detenida sobre la invarianza de su forma y fun.
- Aldao, A., Jazaieri, H., Goldin, P. R., & Gross, J. J. (2014). Adaptive and maladaptive emotion regulation strategies: Interactive effects during CBT for social anxiety disorder. *Journal of anxiety disorders, 28*(4), 382-389.
- Aldao, A., & Nolen-Hoeksema, S. (2012). When are adaptive strategies most predictive of psychopathology? *Journal of abnormal psychology, 121*(1), 276.

- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review, 30*(2), 217-237.
- Allemand, M., Zimprich, D., & Hertzog, C. (2007). Cross-sectional age differences and longitudinal age changes of personality in middle adulthood and old age. *Journal of personality, 75*(2), 323-358.
- Andrews, G., Slade, T., & Issakidis, C. (2002). Deconstructing current comorbidity: data from the Australian National Survey of Mental Health and Well-being. *The British Journal of Psychiatry, 181*(4), 306-314.
- Asparouhov, T., & Muthén, B. (2014a). Auxiliary variables in mixture modeling: Three-step approaches using M plus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329-341.
- Asparouhov, T., & Muthén, B. (2014b). Auxiliary variables in mixture modeling: Using the BCH method in Mplus to estimate a distal outcome model and an arbitrary secondary model. *Mplus web notes, 21*(2), 1-22.
- Asparouhov, T., & Muthén, B. (2015). Residual associations in latent class and latent transition analysis. *Structural Equation Modeling: A Multidisciplinary Journal, 22*(2), 169-177.
- Association, A. P. (2013). Desk reference to the diagnostic criteria from DSM-5.
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27-45.
- Bakk, Z., & Vermunt, J. K. (2016). Robustness of stepwise latent class modeling with continuous distal outcomes. *Structural Equation Modeling: A Multidisciplinary Journal, 23*(1), 20-31.

- Balleine, B. W., & Dickinson, A. (1998). Goal-directed instrumental action: contingency and incentive learning and their cortical substrates. *Neuropharmacology*, 37(4-5), 407-419.
- Barkley, R. A. (1997). Behavioral inhibition, sustained attention, and executive functions: constructing a unifying theory of ADHD. *Psychological bulletin*, 121(1), 65.
- Barkley, R. A. (2001). The executive functions and self-regulation: An evolutionary neuropsychological perspective. *Neuropsychology review*, 11(1), 1-29.
- Barkley, R. A., Edwards, G., Laneri, M., Fletcher, K., & Metevia, L. (2001). Executive functioning, temporal discounting, and sense of time in adolescents with attention deficit hyperactivity disorder (ADHD) and oppositional defiant disorder (ODD). *Journal of abnormal child psychology*, 29(6), 541-556.
- Barlow, D. H. (2000). Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American psychologist*, 55(11), 1247.
- Barlow, D. H., Farchione, T. J., Bullis, J. R., Gallagher, M. W., Murray-Latin, H., Sauer-Zavala, S., . . . Boswell, J. F. (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.
- Barlow, D. H., Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Allen, L. B., & May, J. T. E. (2010). *Unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide*: Oxford University Press.
- Bauer, D. J., & Curran, P. J. (2004). The integration of continuous and discrete latent variable models: potential problems and promising opportunities. *Psychological methods*, 9(1), 3.



- Bayes, A., Parker, G., & McClure, G. (2016). Emotional dysregulation in those with bipolar disorder, borderline personality disorder and their comorbid expression. *Journal of affective disorders, 204*, 103-111.
- Beauchaine, T. P. (2015). Future directions in emotion dysregulation and youth psychopathology. *Journal of Clinical Child & Adolescent Psychology, 44*(5), 875-896.
- Beauchaine, T. P., & McNulty, T. (2013). Comorbidities and continuities as ontogenic processes: Toward a developmental spectrum model of externalizing psychopathology. *Development and psychopathology, 25*(4pt2), 1505-1528.
- Beck, A., & Steer, R. (1990). BAI, Beck Anxiety Inventory San Antonio, TX: Psychological Corporation. In: Harcourt Brave Jovanovich.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories-IA and-II in psychiatric outpatients. *Journal of personality assessment, 67*(3), 588-597.
- Belsky, J. (2016). The differential susceptibility hypothesis: sensitivity to the environment for better and for worse. *JAMA pediatrics, 170*(4), 321-322.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological bulletin, 107*(2), 238.
- Boden, M. T., Berenbaum, H., & Gross, J. J. (2016). Why do people believe what they do? A functionalist perspective. *Review of general psychology, 20*(4), 399-411.
- Bolck, A., Croon, M., & Hagenars, J. (2004). Estimating latent structure models with categorical variables: One-step versus three-step estimators. *Political analysis, 12*(1), 3-27.
- Borkovec, T. (1994). The nature, functions, and origins of worry.

- Borkovec, T. D., Alcaine, O., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. *Generalized anxiety disorder: Advances in research and practice, 2004*, 77-108.
- Borkovec, T. D., & Roemer, L. (1995). Perceived functions of worry among generalized anxiety disorder subjects: Distraction from more emotionally distressing topics? *Journal of behavior therapy and experimental psychiatry, 26*(1), 25-30.
- Borsboom, D. (2008). Psychometric perspectives on diagnostic systems. *Journal of clinical psychology, 64*(9), 1089-1108.
- Borsboom, D. (2017). A network theory of mental disorders. *World psychiatry, 16*(1), 5-13.
- Borsboom, D., & Cramer, A. O. (2013). Network analysis: an integrative approach to the structure of psychopathology. *Annual review of clinical psychology, 9*(1), 91-121.
- Boschloo, L., Schoevers, R. A., van Borkulo, C. D., Borsboom, D., & Oldehinkel, A. J. (2016). The network structure of psychopathology in a community sample of preadolescents. *Journal of abnormal psychology, 125*(4), 599.
- Brown, T. A., & Barlow, D. H. (2009). A proposal for a dimensional classification system based on the shared features of the DSM-IV anxiety and mood disorders: implications for assessment and treatment. *Psychological assessment, 21*(3), 256.
- Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of abnormal psychology, 110*(4), 585.
- Cai, R. Y., Richdale, A. L., Uljarević, M., Dissanayake, C., & Samson, A. C. (2018). Emotion regulation in autism spectrum disorder: Where we are and where we need to go. *Autism Research, 11*(7), 962-978.

- Cannon, T. D., Chung, Y., He, G., Sun, D., Jacobson, A., van Erp, T. G., . . . Cadenhead, K. (2015). Progressive reduction in cortical thickness as psychosis develops: a multisite longitudinal neuroimaging study of youth at elevated clinical risk. *Biological psychiatry*, 77(2), 147-157.
- Carstensen, L. L., Pasupathi, M., Mayr, U., & Nesselroade, J. R. (2000). Emotional experience in everyday life across the adult life span. *Journal of personality and social psychology*, 79(4), 644.
- Carver, C. S., & Johnson, S. L. (2018). Impulsive reactivity to emotion and vulnerability to psychopathology. *American psychologist*, 73(9), 1067.
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of personality and social psychology*, 56(2), 267.
- Caspi, A., Houts, R. M., Belsky, D. W., Goldman-Mellor, S. J., Harrington, H., Israel, S., . . . Poulton, R. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clinical Psychological Science*, 2(2), 119-137.
- Caspi, A., & Moffitt, T. E. (2018). All for one and one for all: Mental disorders in one dimension. *American Journal of psychiatry*, 175(9), 831-844.
- Černis, E., Dunn, G., Startup, H., Kingdon, D., Wingham, G., Evans, N., . . . Mander, H. (2016). The perseverative thinking questionnaire in patients with persecutory delusions. *Behavioural and Cognitive Psychotherapy*, 44(4), 472-481.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and psychopathology*, 8(4), 597-600.
- Clark, L. A., Cuthbert, B., Lewis-Fernandez, R., Narrow, W. E., & Reed, G. M. (2017). Three Approaches to Understanding and Classifying Mental Disorder: ICD-11, DSM-5, and the

- National Institute of Mental Health's Research Domain Criteria (RDoC). *Psychol Sci Public Interest*, 18(2), 72-145. doi:10.1177/1529100617727266
- Clark, L. A., Cuthbert, B., Lewis-Fernández, R., Narrow, W. E., & Reed, G. M. (2017). Three approaches to understanding and classifying mental disorder: ICD-11, DSM-5, and the National Institute of Mental Health's Research Domain Criteria (RDoC). *Psychological Science in the Public Interest*, 18(2), 72-145.
- Clark, L. A., Watson, D., & Reynolds, S. (1995). Diagnosis and classification of psychopathology: Challenges to the current system and future directions. *Annual review of psychology*, 46(1), 121-153.
- Clark, S. L., Muthén, B., Kaprio, J., D'Onofrio, B. M., Viken, R., & Rose, R. J. (2013). Models and strategies for factor mixture analysis: An example concerning the structure underlying psychological disorders. *Structural Equation Modeling: A Multidisciplinary Journal*, 20(4), 681-703.
- Clementz, B. A., Sweeney, J. A., Hamm, J. P., Ivleva, E. I., Ethridge, L. E., Pearlson, G. D., . . . Tamminga, C. A. (2016). Identification of distinct psychosis biotypes using brain-based biomarkers. *American Journal of psychiatry*, 173(4), 373-384.
- Cludius, B., Mennin, D., & Ehring, T. (2020). Emotion regulation as a transdiagnostic process. *Emotion*, 20(1), 37.
- Costa, P. T., & McCrae, R. R. (1988). Personality in adulthood: a six-year longitudinal study of self-reports and spouse ratings on the NEO Personality Inventory. *Journal of personality and social psychology*, 54(5), 853.
- Cramer, A. O., Waldorp, L. J., Van Der Maas, H. L., & Borsboom, D. (2010). Comorbidity: A network perspective. *Behavioral and brain sciences*, 33(2-3), 137-150.

- Crocker, P. R. (1997). A confirmatory factor analysis of the positive affect negative affect schedule (PANAS) with a youth sport sample. *Journal of Sport & Exercise Psychology*.
- Cuthbert, B. N., & Insel, T. R. (2013). Toward the future of psychiatric diagnosis: the seven pillars of RDoC. *BMC medicine*, *11*(1), 1-8.
- Dalglish, T., Black, M., Johnston, D., & Bevan, A. (2020). Transdiagnostic approaches to mental health problems: Current status and future directions. *Journal of consulting and clinical psychology*, *88*(3), 179.
- Dan-Glauser, E. S., & Scherer, K. R. (2013). The difficulties in emotion regulation scale (DERS). *Swiss Journal of Psychology*, *72*(1), 5-11.
- Daros, A. R., & Williams, G. E. (2019). A meta-analysis and systematic review of emotion-regulation strategies in borderline personality disorder. *Harvard Review of Psychiatry*, *27*(4), 217-232.
- De Boeck, P., Wilson, M., & Acton, G. S. (2005). A conceptual and psychometric framework for distinguishing categories and dimensions. *Psychological Review*, *112*(1), 129.
- de Carvalho Braule Pinto, A. L., R Pasian, S., & F Malloy-Diniz, L. (2022). Identifying and validating emotion regulation latent profiles and their relationship with affective variables. *Journal of clinical psychology*, *78*(2), 249-265.
- Eaton, N. R., Rodriguez-Seijas, C., Carragher, N., & Krueger, R. F. (2015). Transdiagnostic factors of psychopathology and substance use disorders: a review. *Social psychiatry and psychiatric epidemiology*, *50*(2), 171-182.
- Eaton, W. W., Badawi, M., & Melton, B. (1995). Prodromes and precursors: epidemiologic data for primary prevention of disorders with slow onset. *The American journal of psychiatry*.

- Ebesutani, C., McLeish, A. C., Luberto, C. M., Young, J., & Maack, D. J. (2014). A bifactor model of anxiety sensitivity: Analysis of the Anxiety Sensitivity Index-3. *Journal of Psychopathology and Behavioral Assessment, 36*(3), 452-464.
- Ellard, K. K., Fairholme, C. P., Boisseau, C. L., Farchione, T. J., & Barlow, D. H. (2010). Unified protocol for the transdiagnostic treatment of emotional disorders: Protocol development and initial outcome data. *Cognitive and Behavioral Practice, 17*(1), 88-101.
- English, T., John, O. P., Srivastava, S., & Gross, J. J. (2012). Emotion regulation and peer-rated social functioning: A 4-year longitudinal study. *Journal of research in personality, 46*(6), 780-784.
- Everaert, J., & Joormann, J. (2019). Emotion regulation difficulties related to depression and anxiety: A network approach to model relations among symptoms, positive reappraisal, and repetitive negative thinking. *Clinical Psychological Science, 7*(6), 1304-1318.
- Farchione, T. J., Fairholme, C. P., Ellard, K. K., Boisseau, C. L., Thompson-Hollands, J., Carl, J. R., . . . Barlow, D. H. (2012). Unified protocol for transdiagnostic treatment of emotional disorders: a randomized controlled trial. *Behavior therapy, 43*(3), 666-678.
- Fernandez, K. C., Jazaieri, H., & Gross, J. J. (2016). Emotion regulation: a transdiagnostic perspective on a new RDoC domain. *Cognitive Therapy and Research, 40*(3), 426-440.
- Fichter, M., Quadflieg, N., Fischer, U. C., & Kohlboeck, G. (2010). Twenty-five-year course and outcome in anxiety and depression in the Upper Bavarian Longitudinal Community Study. *Acta Psychiatrica Scandinavica, 122*(1), 75-85.
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological assessment, 7*(3), 286.

- Fossati, A., Gratz, K. L., Maffei, C., & Borroni, S. (2014). Impulsivity dimensions, emotion dysregulation, and borderline personality disorder features among Italian nonclinical adolescents. *Borderline personality disorder and emotion dysregulation*, *1*(1), 1-11.
- Fried, E. I., & Cramer, A. O. (2017). Moving forward: Challenges and directions for psychopathological network theory and methodology. *Perspectives on Psychological Science*, *12*(6), 999-1020.
- Fried, E. I., & Nesse, R. M. (2015). Depression is not a consistent syndrome: an investigation of unique symptom patterns in the STAR\* D study. *Journal of affective disorders*, *172*, 96-102.
- Galatzer-Levy, I. R., & Bryant, R. A. (2013). 636,120 ways to have posttraumatic stress disorder. *Perspectives on psychological science*, *8*(6), 651-662.
- Garland, E. L., & Howard, M. O. (2013). Mindfulness-oriented recovery enhancement reduces pain attentional bias in chronic pain patients. *Psychotherapy and psychosomatics*, *82*(5), 311-318.
- Gee, G. C., & Payne-Sturges, D. C. (2004). Environmental health disparities: a framework integrating psychosocial and environmental concepts. *Environmental health perspectives*, *112*(17), 1645-1653.
- Gillan, C. M., Kosinski, M., Whelan, R., Phelps, E. A., & Daw, N. D. (2016). Characterizing a psychiatric symptom dimension related to deficits in goal-directed control. *elife*, *5*, e11305.
- Goekoop, R., & Goekoop, J. G. (2014). A network view on psychiatric disorders: network clusters of symptoms as elementary syndromes of psychopathology. *PloS one*, *9*(11), e112734.

- Goldin, P. R., Jazaieri, H., Ziv, M., Kraemer, H., Heimberg, R. G., & Gross, J. J. (2013). Changes in positive self-views mediate the effect of cognitive-behavioral therapy for social anxiety disorder. *Clinical Psychological Science, 1*(3), 301-310.
- Goldin, P. R., Manber, T., Hakimi, S., Canli, T., & Gross, J. J. (2009). Neural bases of social anxiety disorder: emotional reactivity and cognitive regulation during social and physical threat. *Archives of general psychiatry, 66*(2), 170-180.
- Gotlib, I. H., & Joormann, J. (2010). Cognition and depression: current status and future directions. *Annual review of clinical psychology, 6*, 285.
- Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual review of psychology, 60*(1), 549-576.
- 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.
- Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment, 11*(4), 330-341.
- Greenberg, L. S. (2004). Emotion-focused therapy. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 11*(1), 3-16.
- Grierson, A., Hickie, I., Naismith, S., & Scott, J. (2016). The role of rumination in illness trajectories in youth: linking trans-diagnostic processes with clinical staging models. *Psychological medicine, 46*(12), 2467-2484.
- Gross, J., & John, O. (2013). Emotion regulation questionnaire. Measurement instrument database for the social science. In: Diakses dari [www. midss. ie](http://www.midss.ie).



- Gross, J. J. (1998a). Antecedent-and response-focused emotion regulation: divergent consequences for experience, expression, and physiology. *Journal of personality and social psychology*, 74(1), 224.
- Gross, J. J. (1998b). The emerging field of emotion regulation: An integrative review. *Review of general psychology*, 2(3), 271-299.
- Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current directions in psychological science*, 10(6), 214-219.
- Gross, J. J. (2013). *Handbook of emotion regulation*: Guilford publications.
- Gross, J. J. (2015a). Emotion regulation: Current status and future prospects. *Psychological inquiry*, 26(1), 1-26.
- Gross, J. J. (2015b). The extended process model of emotion regulation: Elaborations, applications, and future directions. *Psychological inquiry*, 26(1), 130-137.
- Gross, J. J., & Feldman Barrett, L. (2011). Emotion generation and emotion regulation: One or two depends on your point of view. *Emotion review*, 3(1), 8-16.
- Gross, J. J., & Jazaieri, H. (2014). Emotion, emotion regulation, and psychopathology: An affective science perspective. *Clinical Psychological Science*, 2(4), 387-401.
- 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(2), 348.
- Gross, J. J., John, O. P., & Richards, J. M. (2000). The dissociation of emotion expression from emotion experience: A personality perspective. *Personality and Social Psychology Bulletin*, 26(6), 712-726.

- Gruber, J., Eidelman, P., & Harvey, A. G. (2008). Transdiagnostic emotion regulation processes in bipolar disorder and insomnia. *Behaviour research and therapy*, 46(9), 1096-1100.
- Gunderson, J. G., Gratz, K. L., Neuhaus, E. C., & Smith, G. W. (2005). Levels of care in treatment. *Textbook of personality disorders*, 239-255.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Canonical correlation: A supplement to multivariate data analysis. *Multivariate Data Analysis: A Global Perspective, 7th ed.; Pearson Prentice Hall Publishing: Upper Saddle River, NJ, USA.*
- Harvey, A. G., Watkins, E., & Mansell, W. (2004). *Cognitive behavioural processes across psychological disorders: A transdiagnostic approach to research and treatment*: Oxford University Press, USA.
- Hayes, S. C., & Hofmann, S. G. (2018). *Process-based CBT: The science and core clinical competencies of cognitive behavioral therapy*: New Harbinger Publications.
- Hayes, S. C., Pankey, J., & Gregg, J. (2002). Acceptance and commitment therapy. *Anxiety disorders: A practitioner's guide to comparative treatments*, 110-136.
- Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., . . . Bergan, J. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The psychological record*, 54(4), 553-578.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of consulting and clinical psychology*, 64(6), 1152.
- Heatherton, T. F., & Baumeister, R. F. (1991). Binge eating as escape from self-awareness. *Psychological bulletin*, 110(1), 86.

- Hinshaw, S. P. (2015). Stigma and mental illness: Developmental issues and future prospects. *Developmental Psychopathology: Volume Three: Risk, Disorder, and Adaptation*, 841-881.
- Hofmann, S. G., & Hayes, S. C. (2019). The future of intervention science: Process-based therapy. *Clinical Psychological Science*, 7(1), 37-50.
- Holahan, C. J., Moos, R. H., Holahan, C. K., Cronkite, R. C., & Randall, P. K. (2003). Drinking to cope and alcohol use and abuse in unipolar depression: a 10-year model. *Journal of Abnormal Psychology*, 112(1), 159.
- Horn, J. L., & McArdle, J. J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental aging research*, 18(3), 117-144.
- Insel, T. (2012). Director's blog: Research domain criteria--RDoC. *National Institute of Mental Health*. March, 6.
- Johnson, S. L., McKenzie, G., & McMurrich, S. (2008). Ruminative responses to negative and positive affect among students diagnosed with bipolar disorder and major depressive disorder. *Cognitive Therapy and Research*, 32(5), 702-713.
- Joormann, J., & Vanderlind, W. M. (2014). Emotion regulation in depression: The role of biased cognition and reduced cognitive control. *Clinical Psychological Science*, 2(4), 402-421.
- Jorm, A. F. (2000). Does old age reduce the risk of anxiety and depression? A review of epidemiological studies across the adult life span. *Psychological medicine*, 30(1), 11-22.
- Judd, L. L., Rapaport, M. H., Yonkers, K. A., Rush, A. J., Frank, E., Thase, M. E., . . . Tollefson, G. (2004). Randomized, placebo-controlled trial of fluoxetine for acute treatment of minor depressive disorder. *American Journal of psychiatry*, 161(10), 1864-1871.

- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour research and therapy*, 44(9), 1301-1320.
- Kato, T. (2012). Development of the Coping Flexibility Scale: evidence for the coping flexibility hypothesis. *Journal of counseling psychology*, 59(2), 262.
- Kawa, S., & Giordano, J. (2012). A brief historicity of the Diagnostic and Statistical Manual of Mental Disorders: issues and implications for the future of psychiatric canon and practice. In (Vol. 7, pp. 1-9): BioMed Central.
- Kessler, R. C., Adler, L. A., Barkley, R., Biederman, J., Conners, C. K., Faraone, S. V., . . . Spencer, T. (2005). Patterns and predictors of attention-deficit/hyperactivity disorder persistence into adulthood: results from the national comorbidity survey replication. *Biological psychiatry*, 57(11), 1442-1451.
- Kessler, R. C., Avenevoli, S., Costello, E. J., Georgiades, K., Green, J. G., Gruber, M. J., . . . Petukhova, M. (2012). Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the National Comorbidity Survey Replication Adolescent Supplement. *Archives of general psychiatry*, 69(4), 372-380.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of general psychiatry*, 62(6), 593-602.
- Khoury, B., & Lecomte, T. (2012). Emotion regulation and schizophrenia. *International Journal of Cognitive Therapy*, 5(1), 67-76.

- Kim, H., & Eaton, N. R. (2015). The hierarchical structure of common mental disorders: Connecting multiple levels of comorbidity, bifactor models, and predictive validity. *Journal of abnormal psychology, 124*(4), 1064.
- Kim, M., Vermunt, J., Bakk, Z., Jaki, T., & Van Horn, M. L. (2016). Modeling predictors of latent classes in regression mixture models. *Structural Equation Modeling: A Multidisciplinary Journal, 23*(4), 601-614.
- Kim, Y., & Muthén, B. O. (2009). Two-part factor mixture modeling: Application to an aggressive behavior measurement instrument. *Structural equation modeling, 16*(4), 602-624.
- Kober, H. (2014). Emotion regulation in substance use disorders.
- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., . . . Clark, L. A. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of abnormal psychology, 126*(4), 454.
- Kraemer, H. C. (1995). Statistical issues in assessing comorbidity. *Statistics in medicine, 14*(8), 721-733.
- Kraepelin, E. (1920). Die erscheinungsformen des irreseins. *Zeitschrift für die gesamte Neurologie und Psychiatrie, 62*(1), 1-29.
- Kring, A. M., & Sloan, D. M. (2009). *Emotion regulation and psychopathology: A transdiagnostic approach to etiology and treatment*: Guilford Press.
- Kross, E., Gard, D., Deldin, P., Clifton, J., & Ayduk, O. (2012). “Asking why” from a distance: Its cognitive and emotional consequences for people with major depressive disorder. *Journal of Abnormal Psychology, 121*(3), 559.

- Krueger, R. F., & Eaton, N. R. (2015). Transdiagnostic factors of mental disorders. *World Psychiatry, 14*(1), 27.
- Kuo, J. R., Khoury, J. E., Metcalfe, R., Fitzpatrick, S., & Goodwill, A. (2015). An examination of the relationship between childhood emotional abuse and borderline personality disorder features: The role of difficulties with emotion regulation. *Child abuse & neglect, 39*, 147-155.
- Kupfer, D. J., Kuhl, E. A., & Regier, D. A. (2013). DSM-5—The future arrived. *Jama, 309*(16), 1691-1692.
- Kuppens, P. (2013). Comment: Appraisal affords flexibility to emotion in more ways than one. *Emotion Review, 5*(2), 176-179.
- Laceulle, O. M., Vollebergh, W. A., & Ormel, J. (2015). The structure of psychopathology in adolescence: Replication of a general psychopathology factor in the TRAILS study. *Clinical Psychological Science, 3*(6), 850-860.
- Lahey, B. B., Krueger, R. F., Rathouz, P. J., Waldman, I. D., & Zald, D. H. (2017). A hierarchical causal taxonomy of psychopathology across the life span. *Psychological bulletin, 143*(2), 142.
- Lahey, B. B., Rathouz, P. J., Keenan, K., Stepp, S. D., Loeber, R., & Hipwell, A. E. (2015). Criterion validity of the general factor of psychopathology in a prospective study of girls. *Journal of Child Psychology and Psychiatry, 56*(4), 415-422.
- Lane, R. D., & Schwartz, G. E. (1987). Levels of emotional awareness: a cognitive-developmental theory and its application to psychopathology. *The American journal of psychiatry.*

- Lanza, S. T., & Rhoades, B. L. (2013). Latent class analysis: an alternative perspective on subgroup analysis in prevention and treatment. *Prevention science, 14*(2), 157-168.
- Lanza, S. T., Tan, X., & Bray, B. C. (2013). Latent class analysis with distal outcomes: A flexible model-based approach. *Structural Equation Modeling: A Multidisciplinary Journal, 20*(1), 1-26.
- Lazarsfeld, P. F., & Henry, N. W. (1968). Latent structure. *Psychology, a study of science, 3*.
- Leue, A., & Beauducel, A. (2011). The PANAS structure revisited: on the validity of a bifactor model in community and forensic samples. *Psychological assessment, 23*(1), 215.
- Levenson, R. W., Carstensen, L. L., Friesen, W. V., & Ekman, P. (1991). Emotion, physiology, and expression in old age. *Psychology and aging, 6*(1), 28.
- Liang, L. A., Berger, U., & Brand, C. (2019). Psychosocial factors associated with symptoms of depression, anxiety and stress among single mothers with young children: A population-based study. *Journal of affective disorders, 242*, 255-264.
- Lilienfeld, S. O., & Treadway, M. T. (2016). Clashing diagnostic approaches: DSM-ICD versus RDoC. *Annual review of clinical psychology, 12*, 435.
- Linehan, M. M. (2018). *Cognitive-behavioral treatment of borderline personality disorder*: Guilford Publications.
- Linehan, M. M., & Kehrer, C. A. (1993). Borderline personality disorder. *Clinical handbook of psychological disorders, 2*.
- Lischetzke, T., Cuccodoro, G., Gauger, A., Todeschini, L., & Eid, M. (2005). Measuring affective clarity indirectly: individual differences in response latencies of state. *Emotion, 5*(4), 431.

- Lischetzke, T., & Eid, M. (2003). Is attention to feelings beneficial or detrimental to affective well-being? Mood regulation as a moderator variable. *Emotion, 3*(4), 361.
- Liverant, G. I., Brown, T. A., Barlow, D. H., & Roemer, L. (2008). Emotion regulation in unipolar depression: The effects of acceptance and suppression of subjective emotional experience on the intensity and duration of sadness and negative affect. *Behaviour research and therapy, 46*(11), 1201-1209.
- Livesley, W. J., Jackson, D. N., & Schroeder, M. L. (1992). Factorial structure of traits delineating personality disorders in clinical and general population samples. *Journal of Abnormal Psychology, 101*(3), 432.
- Livingstone, K., Harper, S., & Gillanders, D. (2009). An exploration of emotion regulation in psychosis. *Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice, 16*(5), 418-430.
- Lubke, G., Muthén, B., & Larsen, K. (2002). Empirical identifiability of factor mixture models. *Unpublished manuscript.*
- Lubke, G., & Neale, M. C. (2006). Distinguishing between latent classes and continuous factors: Resolution by maximum likelihood? *Multivariate Behavioral Research, 41*(4), 499-532.
- Markon, K. E., Krueger, R. F., & Watson, D. (2005). Delineating the structure of normal and abnormal personality: an integrative hierarchical approach. *Journal of personality and social psychology, 88*(1), 139.
- Marmorstein, N. R. (2013). Associations between dispositions to rash action and internalizing and externalizing symptoms in children. *Journal of Clinical Child & Adolescent Psychology, 42*(1), 131-138.



- Martin-Soelch, C., Linthicum, J., & Ernst, M. (2007). Appetitive conditioning: neural bases and implications for psychopathology. *Neuroscience & Biobehavioral Reviews*, *31*(3), 426-440.
- Mauss, I. B., Bunge, S. A., & Gross, J. J. (2007). Automatic emotion regulation. *Social and Personality Psychology Compass*, *1*(1), 146-167.
- Mauss, I. B., Cook, C. L., Cheng, J. Y., & Gross, J. J. (2007). Individual differences in cognitive reappraisal: Experiential and physiological responses to an anger provocation. *International Journal of Psychophysiology*, *66*(2), 116-124.
- McEvoy, P. M., Hyett, M. P., Ehring, T., Johnson, S. L., Samtani, S., Anderson, R., & Moulds, M. L. (2018). Transdiagnostic assessment of repetitive negative thinking and responses to positive affect: Structure and predictive utility for depression, anxiety, and mania symptoms. *Journal of affective disorders*, *232*, 375-384.
- McGrogan, C. L., Dodd, A. L., & Smith, M. A. (2019). Emotion regulation strategies in mania risk: a systematic review. *Journal of clinical psychology*, *75*(12), 2106-2118.
- McKenzie, K. C., & Gross, J. J. (2014). Nonsuicidal self-injury: an emotion regulation perspective. *Psychopathology*, *47*(4), 207-219.
- McLaughlin, K. A., & Nolen-Hoeksema, S. (2011). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour research and therapy*, *49*(3), 186-193.
- McNally, R. J. (2002). Anxiety sensitivity and panic disorder. *Biological psychiatry*, *52*(10), 938-946.
- Meehl, P. E., & Golden, R. R. (1982). Taxometric methods. *Handbook of research methods in clinical psychology*, 127-181.

- Mennin, D. S., & Fresco, D. M. (2013). What, me worry and ruminate about DSM-5 and RDoC? The importance of targeting negative self-referential processing. *Clinical psychology: Science and practice, 20*(3), 258-267.
- Mennin, D. S., Fresco, D. M., Ritter, M., & Heimberg, R. G. (2015). An open trial of emotion regulation therapy for generalized anxiety disorder and cooccurring depression. *Depression and anxiety, 32*(8), 614-623.
- Meredith, W., & Teresi, J. A. (2006). An essay on measurement and factorial invariance. *Medical care, S69-S77*.
- Meyers, L. S., Gamst, G., & Guarino, A. J. (2016). *Applied multivariate research: Design and interpretation*: Sage publications.
- Milad, M. R., Rosenbaum, B. L., & Simon, N. M. (2014). Neuroscience of fear extinction: implications for assessment and treatment of fear-based and anxiety related disorders. *Behaviour research and therapy, 62*, 17-23.
- Mineka, S., Watson, D., & Clark, L. A. (1998). Comorbidity of anxiety and unipolar mood disorders. *Annual review of psychology, 49*(1), 377-412.
- Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C. (2001). Psychiatric aspects of impulsivity. *American Journal of psychiatry, 158*(11), 1783-1793.
- Molnar, B. E., Berkman, L. F., & Buka, S. L. (2001). Psychopathology, childhood sexual abuse and other childhood adversities: relative links to subsequent suicidal behaviour in the US. *Psychological medicine, 31*(6), 965-977.
- Morey, L. C., Krueger, R. F., & Skodol, A. E. (2013). The hierarchical structure of clinician ratings of proposed DSM-5 pathological personality traits. *Journal of abnormal psychology, 122*(3), 836.

- Morin, A. J., Arens, A. K., & Marsh, H. W. (2016). A bifactor exploratory structural equation modeling framework for the identification of distinct sources of construct-relevant psychometric multidimensionality. *Structural Equation Modeling: A Multidisciplinary Journal*, 23(1), 116-139.
- Moustafa, A. A., Tindle, R., Frydecka, D., & Misiak, B. (2017). Impulsivity and its relationship with anxiety, depression and stress. *Comprehensive psychiatry*, 74, 173-179.
- Muhtadie, L., Johnson, S. L., Carver, C. S., Gotlib, I. H., & Ketter, T. A. (2014). A profile approach to impulsivity in bipolar disorder: the key role of strong emotions. *Acta Psychiatrica Scandinavica*, 129(2), 100-108.
- Muthén, L. K., & Muthén, B. O. (1998). *Mplus: The comprehensive modeling program for applied researchers: User's guide*: Muthén & Muthén.
- Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Structural equation modeling*, 9(4), 599-620.
- Nagin, D. S., & Nagin, D. (2005). *Group-based modeling of development*: Harvard University Press.
- Narrow, W. E., & Kuhl, E. A. (2011). Dimensional approaches to psychiatric diagnosis in DSM-5. *Journal of Mental Health Policy and Economics*.
- Nestler, E. J., & Carlezon Jr, W. A. (2006). The mesolimbic dopamine reward circuit in depression. *Biological psychiatry*, 59(12), 1151-1159.
- Nigg, J. T. (2017). Annual Research Review: On the relations among self-regulation, self-control, executive functioning, effortful control, cognitive control, impulsivity, risk-taking, and inhibition for developmental psychopathology. *Journal of child psychology and psychiatry*, 58(4), 361-383.

- Nitschke, J. B., Heller, W., Imig, J. C., McDonald, R. P., & Miller, G. A. (2001). Distinguishing dimensions of anxiety and depression. *Cognitive Therapy and Research*, 25(1), 1-22.
- Nock, M. K. (2010). Self-injury. *Annual Review of Clinical Psychology*, 6(1), 339-363.
- Nock, M. K., & Banaji, M. R. (2007). Prediction of suicide ideation and attempts among adolescents using a brief performance-based test. *Journal of consulting and clinical psychology*, 75(5), 707.
- Nolen-Hoeksema, S. (2011). Lost in thought: The perils of rumination.
- Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on psychological science*, 3(5), 400-424.
- Norton, P. J., & Paulus, D. J. (2017). Transdiagnostic models of anxiety disorder: Theoretical and empirical underpinnings. *Clinical psychology review*, 56, 122-137.
- Nunnally, J. C., & Bernstein, I. (1978). *Psychometric Theory*, ed. New York McGraw.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(4), 535-569.
- Ochsner, K. N., & Gross, J. J. (2014). The neural bases of emotion and emotion regulation: A valuation perspective.
- Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: a meta-analytic review. *Clinical psychology review*, 27(5), 572-581.
- Organization, W. H. (2015). *Tracking universal health coverage: first global monitoring report*: World Health Organization.
- Orgeta, V. (2009). Specificity of age differences in emotion regulation. *Aging and Mental Health*, 13(6), 818-826.

- Orsillo, S. M., & Roemer, L. (2007). *Acceptance-and mindfulness-based approaches to anxiety: Conceptualization and treatment*: Springer Science & Business Media.
- Oxman, A. D., Bjørndal, A., Flottorp, S. A., Lewin, S., & Lindahl, A. K. (2008). Integrated health care for people with chronic conditions. A policy brief.
- Payne, L. A., Ellard, K. K., Farchione, T. J., Fairholme, C. P., & Barlow, D. H. (2014). Emotional disorders: A unified transdiagnostic protocol.
- Peterson, A. L., Chen, J. I., Karver, M. S., & Labouliere, C. D. (2019). Frustration with feeling: Latent classes of non-suicidal self-injury and emotion regulation difficulties. *Psychiatry research*, 275, 61-70.
- Plate, A. J., Aldao, A., Quintero, J. M., & Mennin, D. S. (2016). Interactions between reappraisal and emotional nonacceptance in psychopathology: Examining disability and depression symptoms in generalized anxiety disorder. *Cognitive Therapy and Research*, 40(6), 733-746.
- Preece, D. A., Becerra, R., Hasking, P., McEvoy, P. M., Boyes, M., Sauer-Zavala, S., . . . Gross, J. J. (2021). The emotion regulation questionnaire: Psychometric properties and relations with affective symptoms in a United States general community sample. *Journal of affective disorders*, 284, 27-30.
- Rangel, A., Camerer, C., & Montague, P. R. (2008). A framework for studying the neurobiology of value-based decision making. *Nature reviews neuroscience*, 9(7), 545-556.
- Rapoport, J., Giedd, J., & Gogtay, N. (2012). Neurodevelopmental model of schizophrenia: update 2012. *Molecular psychiatry*, 17(12), 1228-1238.
- Reeck, C., Ames, D. R., & Ochsner, K. N. (2016). The social regulation of emotion: An integrative, cross-disciplinary model. *Trends in cognitive sciences*, 20(1), 47-63.

- Regier, D., Kuhl, E., Narrow, W., & Kupfer, D. (2012). Research planning for the future of psychiatric diagnosis. *European Psychiatry, 27*(7), 553-556.
- Regier, D. A., Kuhl, E. A., & Kupfer, D. J. (2013). The DSM-5: Classification and criteria changes. *World psychiatry, 12*(2), 92-98.
- Regier, D. A., Narrow, W. E., Kuhl, E. A., & Kupfer, D. J. (2009). The conceptual development of DSM-V. *American Journal of psychiatry, 166*(6), 645-650.
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: the cognitive costs of keeping one's cool. *Journal of personality and social psychology, 79*(3), 410.
- Ritschel, L. A., Tone, E. B., Schoemann, A. M., & Lim, N. E. (2015). Psychometric properties of the Difficulties in Emotion Regulation Scale across demographic groups. *Psychological assessment, 27*(3), 944.
- Roemer, L., Lee, J. K., Salters-Pedneault, K., Erisman, S. M., Orsillo, S. M., & Mennin, D. S. (2009). Mindfulness and emotion regulation difficulties in generalized anxiety disorder: Preliminary evidence for independent and overlapping contributions. *Behavior therapy, 40*(2), 142-154.
- Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: Realizing the promise of affective science.
- Ruscio, J., Haslam, N., & Ruscio, A. M. (2013). *Introduction to the taxometric method: A practical guide*: Routledge.
- Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of personality and social psychology, 69*(4), 719.

- Salovey, P., Mayer, J. D., Goldman, S. L., Turvey, C., & Palfai, T. P. (1995). Emotional Attention, clarity, and repair: exploring emotional intelligence using the trait meta-mood scale.
- Salters-Pedneault, K., Roemer, L., Tull, M. T., Rucker, L., & Mennin, D. S. (2006). Evidence of broad deficits in emotion regulation associated with chronic worry and generalized anxiety disorder. *Cognitive Therapy and Research*, 30(4), 469-480.
- Samson, A. C., Huber, O., & Gross, J. J. (2012). Emotion regulation in Asperger's syndrome and high-functioning autism. *Emotion*, 12(4), 659.
- Saris, W. E., Satorra, A., & Van der Veld, W. M. (2009). Testing structural equation models or detection of misspecifications? *Structural equation modeling*, 16(4), 561-582.
- Sass, D. A., & Schmitt, T. A. (2013). Testing measurement and structural invariance: Implications for practice. In *Handbook of quantitative methods for educational research* (pp. 315-345): Brill.
- Schäfer, J. Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of youth and adolescence*, 46(2), 261-276.
- Schoenleber, M., & Berenbaum, H. (2012). Shame regulation in personality pathology. *Journal of abnormal psychology*, 121(2), 433.
- Scott, J., Leboyer, M., Hickie, I., Berk, M., Kapczynski, F., Frank, E., . . . McGorry, P. (2013). Clinical staging in psychiatry: a cross-cutting model of diagnosis with heuristic and practical value. *The British Journal of Psychiatry*, 202(4), 243-245.

- Sekar, A., Bialas, A. R., De Rivera, H., Davis, A., Hammond, T. R., Kamitaki, N., . . . Van Doren, V. (2016). Schizophrenia risk from complex variation of complement component 4. *Nature*, *530*(7589), 177-183.
- Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: a conceptual framework and supporting evidence. *Journal of Experimental Psychology: General*, *143*(1), 163.
- Sheppes, G., Suri, G., & Gross, J. J. (2015). Emotion regulation and psychopathology. *Annual Review of Clinical Psychology*, *11*, 379-405. doi:10.1146/annurev-clinpsy-032814-112739
- Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. *Clinical psychology review*, *57*, 141-163.
- Snyder, H. R., Young, J. F., & Hankin, B. L. (2017). Strong homotypic continuity in common psychopathology-, internalizing-, and externalizing-specific factors over time in adolescents. *Clinical Psychological Science*, *5*(1), 98-110.
- Soenke, M., Hahn, K. S., Tull, M. T., & Gratz, K. L. (2010). Exploring the relationship between childhood abuse and analogue generalized anxiety disorder: The mediating role of emotion dysregulation. *Cognitive Therapy and Research*, *34*(5), 401-412.
- Spaapen, D. L., Waters, F., Brummer, L., Stopa, L., & Bucks, R. S. (2014). The emotion regulation questionnaire: validation of the ERQ-9 in two community samples. *Psychological assessment*, *26*(1), 46.



- Specker, P., & Nickerson, A. (2019). Investigating the relationship between distinctive patterns of emotion regulation, trauma exposure and psychopathology among refugees resettled in Australia: A latent class analysis. *European Journal of Psychotraumatology*, *10*(1), 1661814.
- Spitzer, R. L., & Wakefield, J. C. (1999). DSM-IV diagnostic criterion for clinical significance: does it help solve the false positives problem? *American Journal of psychiatry*, *156*(12), 1856-1864.
- SPSS, I. (2013). IBM SPSS statistics for windows. *Armonk, New York, USA: IBM SPSS*, 2.
- Steer, R. A., Ranieri, W. F., Beck, A. T., & Clark, D. A. (1993). Further evidence for the validity of the Beck Anxiety Inventory with psychiatric outpatients. *Journal of anxiety disorders*, *7*(3), 195-205.
- Stegge, H., & Terwogt, M. M. (2007). Awareness and regulation of emotion in typical and atypical development. *Handbook of emotion regulation*, *269*, 286.
- Suárez, L. M., Bennett, S. M., Goldstein, C. R., & Barlow, D. H. (2009). Understanding anxiety disorders from a "triple vulnerability" framework.
- Suri, G., Sheppes, G., & Gross, J. J. (2015). The role of action readiness in motivated behavior. *Journal of Experimental Psychology: General*, *144*(6), 1105.
- Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics: International edition. *Pearson2012*, 1.
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5): pearson Boston, MA.
- Tamminga, C. A., Ivleva, E. I., Keshavan, M. S., Pearlson, G. D., Clementz, B. A., Witte, B., . . . Sweeney, J. A. (2013). Clinical phenotypes of psychosis in the Bipolar-Schizophrenia

- Network on Intermediate Phenotypes (B-SNIP). *American Journal of psychiatry*, 170(11), 1263-1274.
- Taylor, S., Zvolensky, M. J., Cox, B. J., Deacon, B., Heimberg, R. G., Ledley, D. R., . . . Stewart, S. H. (2007). Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. *Psychological assessment*, 19(2), 176.
- Tomko, R. L., Lane, S. P., Pronove, L. M., Treloar, H. R., Brown, W. C., Solhan, M. B., . . . Trull, T. J. (2015). Undifferentiated negative affect and impulsivity in borderline personality and depressive disorders: A momentary perspective. *Journal of abnormal psychology*, 124(3), 740.
- Treanor, M., Erisman, S. M., Salters-Pedneault, K., Roemer, L., & Orsillo, S. M. (2011). Acceptance-based behavioral therapy for GAD: Effects on outcomes from three theoretical models. *Depression and anxiety*, 28(2), 127-136.
- Tsai, J. L., Levenson, R. W., & Carstensen, L. L. (2000). Autonomic, subjective, and expressive responses to emotional films in older and younger Chinese Americans and European Americans. *Psychology and aging*, 15(4), 684.
- Urry, H. L., & Gross, J. J. (2010). Emotion regulation in older age. *Current directions in psychological science*, 19(6), 352-357.
- van der Velde, J., Gromann, P. M., Swart, M., Wiersma, D., de Haan, L., Bruggeman, R., . . . Aleman, A. (2015). Alexithymia influences brain activation during emotion perception but not regulation. *Social Cognitive and Affective Neuroscience*, 10(2), 285-293.
- van der Velde, J., van Tol, M.-J., Goerlich-Dobre, K. S., Gromann, P. M., Swart, M., de Haan, L., . . . Aleman, A. (2014). Dissociable morphometric profiles of the affective and cognitive dimensions of alexithymia. *Cortex*, 54, 190-199.

- Van Os, J., Linscott, R. J., Myin-Germeys, I., Delespaul, P., & Krabbendam, L. (2009). A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness–persistence–impairment model of psychotic disorder. *Psychological medicine, 39*(2), 179-195.
- Vermunt, J. K. (2010). Latent class modeling with covariates: Two improved three-step approaches. *Political analysis, 18*(4), 450-469.
- Vermunt, J. K., Lewis-Beck, M., Bryman, A., & Liao, T. (2004). Latent profile model. *The sage encyclopedia of social sciences research methods, 554-555*.
- Voon, V., Baek, K., Enander, J., Worbe, Y., Morris, L., Harrison, N., . . . Daw, N. (2015). Motivation and value influences in the relative balance of goal-directed and habitual behaviours in obsessive-compulsive disorder. *Translational psychiatry, 5*(11), e670-e670.
- Wagner, A. W., & Linehan, M. M. (1999). Facial expression recognition ability among women with borderline personality disorder: Implications for emotion regulation? *Journal of personality disorders, 13*(4), 329.
- Watkins, E. (2011). Dysregulation in level of goal and action identification across psychological disorders. *Clinical psychology review, 31*(2), 260-278.
- Watkins, E. R., & Nolen-Hoeksema, S. (2014). A habit-goal framework of depressive rumination. *Journal of Abnormal Psychology, 123*(1), 24.
- Watson, D. (2005). Rethinking the mood and anxiety disorders: a quantitative hierarchical model for DSM-V. *Journal of abnormal psychology, 114*(4), 522.
- Watson, D., Clark, L. A., & Carey, G. (1988). Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of abnormal psychology, 97*(3), 346.

- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology, 54*(6), 1063.
- Weathers, F. W., Keane, T. M., & Davidson, J. R. (2001). Clinician-Administered PTSD Scale: A review of the first ten years of research. *Depression and anxiety, 13*(3), 132-156.
- Wenzlaff, R. M., & Wegner, D. M. (2000). Thought suppression. *Annual review of psychology, 51*(1), 59-91.
- Westbrook, J., & Berenbaum, H. (2017). Emotional awareness moderates the relationship between childhood abuse and borderline personality disorder symptom factors. *Journal of clinical psychology, 73*(7), 910-921.
- Wetherell, J. L., & Areán, P. A. (1997). Psychometric evaluation of the Beck Anxiety Inventory with older medical patients. *Psychological assessment, 9*(2), 136.
- Wetherell, J. L., & Gatz, M. (2005). The Beck Anxiety Inventory in older adults with generalized anxiety disorder. *Journal of Psychopathology and Behavioral Assessment, 27*(1), 17-24.
- Wray, T. B., Simons, J. S., Dvorak, R. D., & Gaher, R. M. (2012). Trait-based affective processes in alcohol-involved “risk behaviors”. *Addictive behaviors, 37*(11), 1230-1239.
- Zaki, L. F., Coifman, K. G., Rafaeli, E., Berenson, K. R., & Downey, G. (2013). Emotion differentiation as a protective factor against nonsuicidal self-injury in borderline personality disorder. *Behavior therapy, 44*(3), 529-540.
- Zanarini, M. C., Frankenburg, F. R., Sickel, A. E., & Yong, L. (1996). The diagnostic interview for DSM-IV personality disorders (DIPD-IV). *Belmont, MA: McLean Hospital, 340*.
- Zanarini, M. C., Vujanovic, A. A., Parachini, E. A., Boulanger, J. L., Frankenburg, F. R., & Hennen, J. (2003). A screening measure for BPD: The McLean screening instrument for

borderline personality disorder (MSI-BPD). *Journal of personality disorders*, 17(6), 568-573.

## LIST OF APPENDICES

APPENDIX A: DEMOGRAPHICS QUESTIONNAIRE

1. What is your age? \_\_\_\_\_
2. What is your gender?
  - 1 = Male
  - 2 = Female
  - 3 = Transgender
3. What is your race?
 

<ul style="list-style-type: none"> <li>1 = White</li> <li>2 = Black/African American</li> <li>3 = American Indian/Alaska Native</li> <li>4 = Asian</li> </ul>	<ul style="list-style-type: none"> <li>5 = Native Hawaiian/Other Pacific Islander</li> <li>6 = Two or More Races, <i>please list numbers:</i> _____</li> <li>7 = Other race, <i>please describe:</i> _____</li> </ul>
---	---
4. Are you of Hispanic, Latino, or Spanish origin?
  - 1 = Yes
  - 2 = No
5. What is your marital status?
 

<ul style="list-style-type: none"> <li>1 = Never married</li> <li>2 = Married</li> <li>3 = Not married, but living with partner</li> </ul>	<ul style="list-style-type: none"> <li>4 = Divorced/Annulled</li> <li>5 = Separated</li> <li>6 = Widowed</li> </ul>
--	---
6. What is your *highest* education level completed?
 

<ul style="list-style-type: none"> <li>1 = 12<sup>th</sup> grade or less, no diploma</li> <li>2 = High school diploma or equivalent</li> <li>3 = Some college, no degree</li> <li>4 = Associates degree</li> </ul>	<ul style="list-style-type: none"> <li>5 = Bachelor's degree</li> <li>6 = Master's degree</li> <li>7 = Professional or doctorate degree</li> </ul>
--	--
7. What best describes your current employment status?
 

<ul style="list-style-type: none"> <li>1 = Unemployed</li> <li>2 = Home Maker</li> <li>3 = Part-Time</li> </ul>	<ul style="list-style-type: none"> <li>4 = Full-Time (35 hours or more a week)</li> <li>5 = Armed Forces</li> <li>6 = Disabled</li> </ul>
---	---
8. What is your total household income (before taxes)? \_\_\_\_\_
9. What is your religious affiliation?
 

<ul style="list-style-type: none"> <li>1 = Protestant</li> <li>2 = Catholic</li> <li>3 = Other Christian, <i>please describe:</i> _____</li> <li>4 = Jewish</li> <li>5 = Muslim</li> </ul>	<ul style="list-style-type: none"> <li>6 = Buddhist</li> <li>7 = Hindu</li> <li>8 = Other Religion, <i>please describe:</i> _____</li> <li>9 = Not Religious</li> </ul>
--	---
10. Are you currently taking any medications?
  - 1 = Yes, *please list medications:* \_\_\_\_\_
  - 2 = No
11. Have you ever been diagnosed with a psychological disorder?
  - 1 = Yes, *please list diagnoses:* \_\_\_\_\_
  - 2 = No



12. Have you ever received treatment for a psychological disorder?

1 = Yes, *please describe*: \_\_\_\_\_

2 = No

APPENDIX B: DIFFICULTIES IN EMOTION REGULATION SCALE (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1.....2.....3.....4.....5

almost never	sometimes	about half the time	most of the time	almost always
(0-10%)	(11-35%)	(36-65%)	(66-90%)	(91-100%)

- \_\_\_\_\_ 1) I am clear about my feelings.
- \_\_\_\_\_ 2) I pay attention to how I feel.
- \_\_\_\_\_ 3) I experience my emotions as overwhelming and out of control.
- \_\_\_\_\_ 4) I have no idea how I am feeling.
- \_\_\_\_\_ 5) I have difficulty making sense out of my feelings.
- \_\_\_\_\_ 6) I am attentive to my feelings.
- \_\_\_\_\_ 7) I know exactly how I am feeling.
- \_\_\_\_\_ 8) I care about what I am feeling.
- \_\_\_\_\_ 9) I am confused about how I feel.
- \_\_\_\_\_ 10) When I'm upset, I acknowledge my emotions.
- \_\_\_\_\_ 11) When I'm upset, I become angry with myself for feeling that way.
- \_\_\_\_\_ 12) When I'm upset, I become embarrassed for feeling that way.
- \_\_\_\_\_ 13) When I'm upset, I have difficulty getting work done.
- \_\_\_\_\_ 14) When I'm upset, I become out of control.
- \_\_\_\_\_ 15) When I'm upset, I believe that I will remain that way for a long time.
- \_\_\_\_\_ 16) When I'm upset, I believe that I will end up feeling very depressed.

- \_\_\_\_\_ 17) When I'm upset, I believe that my feelings are valid and important.
- \_\_\_\_\_ 18) When I'm upset, I have difficulty focusing on other things.
- \_\_\_\_\_ 19) When I'm upset, I feel out of control.
- \_\_\_\_\_ 20) When I'm upset, I can still get things done.
- \_\_\_\_\_ 21) When I'm upset, I feel ashamed at myself for feeling that way.
- \_\_\_\_\_ 22) When I'm upset, I know that I can find a way to eventually feel better.
- \_\_\_\_\_ 23) When I'm upset, I feel like I am weak.
- \_\_\_\_\_ 24) When I'm upset, I feel like I can remain in control of my behaviors.
- \_\_\_\_\_ 25) When I'm upset, I feel guilty for feeling that way.
- \_\_\_\_\_ 26) When I'm upset, I have difficulty concentrating.
- \_\_\_\_\_ 27) When I'm upset, I have difficulty controlling my behaviors.
- \_\_\_\_\_ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.
- \_\_\_\_\_ 29) When I'm upset, I become irritated at myself for feeling that way.
- \_\_\_\_\_ 30) When I'm upset, I start to feel very bad about myself.
- \_\_\_\_\_ 31) When I'm upset, I believe that wallowing in it is all I can do.
- \_\_\_\_\_ 32) When I'm upset, I lose control over my behavior.
- \_\_\_\_\_ 33) When I'm upset, I have difficulty thinking about anything else.
- \_\_\_\_\_ 34) When I'm upset I take time to figure out what I'm really feeling.
- \_\_\_\_\_ 35) When I'm upset, it takes me a long time to feel better.
- \_\_\_\_\_ 36) When I'm upset, my emotions feel overwhelming.

.

APPENDIX C: EMOTION REGULATION QUESTIONNAIRE

**Instructions:** We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Strongly disagree</b>			<b>neutral</b>			<b>Strongly agree</b>

1. \_\_\_\_ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
2. \_\_\_\_ I keep my emotions to myself.
3. \_\_\_\_ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
4. \_\_\_\_ When I am feeling *positive* emotions, I am careful not to express them.
5. \_\_\_\_ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
6. \_\_\_\_ I control my emotions by *not expressing them*.
7. \_\_\_\_ When I want to feel more *positive* emotion, I *change the way I'm thinking about the situation*.
8. \_\_\_\_ I control my emotions by *changing the way I think about the situation I'm in*.

9. \_\_\_\_ When I am feeling *negative* emotions, I make sure not to express them.
10. \_\_\_\_ When I want to feel less *negative* emotion, I *change the way I'm thinking* about  
the situation.

APPENDIX D: BECK'S DEPRESSION INVENTORY



This depression inventory can be self-scored. The scoring scale is at the end of the questionnaire.

1.	0	I do not feel sad
	1	I feel sad
	2	I am sad all the time and I can't snap out of it
	3	I am so sad and unhappy that I can't stand it
2.	0	I am not particularly discouraged about the future
	1	I feel discouraged about the future
	2	I feel I have nothing to look forward to
	3	I feel the future is hopeless and that things cannot improve
3.	0	I do not feel like a failure
	1	I feel I have failed more than the average person
	2	As I look back on my life, all I can see is a lot of failures
	3	I feel I am a complete failure as a person
4.	0	I get as much satisfaction out of things as I used to
	1	I don't enjoy things the way I used to
	2	I don't get real satisfaction out of anything anymore
	3	I am dissatisfied or bored with everything
5.	0	I don't feel particularly guilty
	1	I feel guilty a good part of the time

	2	I feel quite guilty most of the time
	3	I feel guilty all of the time
6.	0	I don't feel I am being punished
	1	I feel I may be punished
	2	I expect to be punished
	3	I feel I am being punished
7.	0	I don't feel disappointed in myself
	1	I am disappointed in myself
	2	I am disgusted with myself
	3	I hate myself
8.	0	I don't feel I am any worse than anybody else
	1	I am critical of myself for my weaknesses or mistakes
	2	I blame myself all the time for my faults
	3	I blame myself for everything bad that happens
9.	0	I don't have any thoughts of killing myself
	1	I have thoughts of killing myself, but I would not carry them out
	2	I would like to kill myself
	3	I would kill myself if I had the chance

10.	0	I don't cry any more than usual
	1	I cry more now than I used to
	2	I cry all the time now
	3	I used to be able to cry, but now I can't cry even though I want to
11.	0	I am no more irritated by things than I ever was
	1	I am slightly more irritated now than usual
	2	I am quite annoyed or irritated a good deal of the time
	3	I feel irritated all the time
12.	0	I have not lost interest in other people
	1	I am less interested in other people than I used to be
	2	I have lost most of my interest in other people
	3	I have lost all of my interest in other people
13.	0	I make decisions about as well as I ever could
	1	I put off making decisions more than I used to
	2	I have greater difficulty in making decisions more than I used to
	3	I can't make decisions at all anymore
14.	0	I don't feel that I look any worse than I used to
	1	I am worried that I am looking old or unattractive

	2	I feel there are permanent changes in my appearance that make me look unattractive
	3	I believe that I look ugly
15.	0	I can work about as well as before
	1	It takes an extra effort to get started at doing something
	2	I have to push myself very hard to do anything
	3	I can't do any work at all
16.	0	I can sleep as well as usual
	1	I don't sleep as well as I used to
	2	I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
	3	I wake up several hours earlier than I used to and cannot get back to sleep.
17.	0	I don't get more tired than usual
	1	I get tired more easily than I used to
	2	I get tired from doing almost anything
	3	I am too tired to do anything
18.	0	My appetite is no worse than usual
	1	My appetite is not as good as it used to be
	2	My appetite is much worse now

	3	I have no appetite at all anymore
19.	0	I haven't lost much weight, if any, lately
	1	I have lost more than five pounds
	2	I have lost more than ten pounds
	3	I have lost more than fifteen pounds
20.	0	I am no more worried about my health than usual
	1	I am worried about physical problems like aches, pains, upset stomach, or constipation
	2	I am very worried about physical problems and it's hard to think of much else
	3	I am so worried about my physical problems that I cannot think of anything else
21.	0	I have not noticed any recent change in my interest in sex
	1	I am less interested in sex than I used to be
	2	I have almost no interest in sex
	3	I have lost interest in sex completely

APPENDIX E: BECK ANXIETY INVENTORY

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not at all	Mildly, but it didn't bother me much	Moderately – it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding / racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot / cold sweats	0	1	2	3

APPENDIX F: MACLEAN SCREENING INSTRUMENT FOR BPD



1. Have any of your closest relationships been troubled by a lot of arguments or repeated breakups? Yes \_\_\_ No \_\_\_
2. Have you deliberately hurt yourself physically (e.g., punched yourself, cut yourself, burned yourself)? How about made a suicide attempt? Yes \_\_\_ No \_\_\_
3. Have you had at least two other problems with impulsivity (e.g., eating binges and spending sprees, drinking too much and verbal outbursts)? Yes \_\_\_ No \_\_\_
4. Have you been extremely moody? Yes \_\_\_ No \_\_\_
5. Have you felt very angry a lot of the time? How about often acted in an angry or sarcastic manner? Yes \_\_\_ No \_\_\_
6. Have you often been distrustful of other people? Yes \_\_\_ No \_\_\_
7. Have you frequently felt unreal or as if things around you were unreal? Yes \_\_\_ No \_\_\_
8. Have you chronically felt empty? Yes \_\_\_ No \_\_\_
9. Have you often felt that you had no idea of who you are or that you have no identity? Yes \_\_\_ No \_\_\_
10. Have you made desperate efforts to avoid feeling abandoned or being abandoned (e.g., repeatedly called someone to reassure yourself that he or she still cared, begged them not to leave you, clung to them physically)? Yes \_\_\_ No \_\_\_

APPENDIX G: POSITIVE AND NEGATIVE AFFECT SCHEDULE

Indicate the extent you have felt this way over the past week.		Very slightly or not at all	A little	Moderately		Quite a bit	Extremely
PAN A S 1	Interested	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 2	Distressed	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 3	Excited	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 4	Upset	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 5	Strong	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 6	Guilty	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 7	Scared	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 8	Hostile	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 9	Enthusiastic	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 10	Proud	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 11	Irritable	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 12	Alert	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 13	Ashamed	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 14	Inspired	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 15	Nervous	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 16	Determined	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 17	Attentive	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 18	Jittery	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5

PAN A S 19	Active	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAN A S 20	Afraid	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3		<input type="checkbox"/> 4	<input type="checkbox"/> 5

APPENDIX H: ANXIETY SENSITIVITY INDEX-3

Enter the number from the scale below that best describes how typical or characteristic each of the 16 items is of *you*, putting the number next to the item. You should make your ratings in terms of how much you agree or disagree with the statement as a *general* description of yourself.

0      1      2      3      4  
very little      a little   some   much   very much

1. It is important for me not to appear nervous.
2. When I cannot keep my mind on a task, I worry that I might be going crazy.
3. It scares me when my heart beats rapidly.
4. When my stomach is upset, I worry that I might be seriously ill.
5. It scares me when I am unable to keep my mind on a task.
6. When I tremble in the presence of others, I fear what people might think of me.
7. When my chest feels tight, I get scared that I won't be able to breathe properly.
8. When I feel pain in my chest, I worry that I'm going to have a heart attack.
9. I worry that other people will notice my anxiety.
10. When I feel "spacey" or spaced out I worry that I may be mentally ill.
11. It scares me when I blush in front of people.
12. When I notice my heart skipping a beat, I worry that there is something seriously wrong with me.
13. When I begin to sweat in a social situation, I fear people will think negatively of me.
14. When my thoughts seem to speed up, I worry that I might be going crazy.
15. When my throat feels tight, I worry that I could choke to death.
16. When I have trouble thinking clearly, I worry that there is something wrong with me.
17. I think it would be horrible for me to faint in public.  
When my mind goes blank, I worry there is something terribly wrong with

## APPENDIX I: LIFE EVENTS CHECKLIST

**Instructions:** Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you.

Event	Happened to me	Witnessed it	Learned about it	Part of my job	Not sure	Doesn't apply
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)						
2. Fire or explosion						
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)						
4. Serious accident at work, home, or during recreational activity						
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)						
6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)						
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)						
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)						
9. Other unwanted or uncomfortable sexual experience						
10. Combat or exposure to a war-zone (in the military or as a civilian)						
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)						
12. Life-threatening illness or injury						
13. Severe human suffering						
14. Sudden violent death (for example, homicide, suicide)						
15. Sudden accidental death						
16. Serious injury, harm, or death you caused to someone else						
17. Any other very stressful event or experience						



LIST OF TABLES

Table 1.

*Overall sample demographic characteristics (N= 1570).*

		<i>N (%)</i>
<i>Ages (M ± SD)</i>		30.75 ± 9.56
<i>Sex</i>	Female	1132 (72.10)
	Male	317 (20.19)
<i>Race</i>	American Indian/Alaska Native	18 (1.15)
	Asian	100 (6.37)
	Black/African American	35 (2.22)
	Native Hawaiian	3 (0.02)
	White	1305 (83.12)
	Other	112 (0.71)

Table 2.

*KMO and Bartlett's test.*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		<b>.961</b>
Bartlett's Test of Sphericity	Approx. Chi-Square	38196.58
	df	5
	Sig.	630
		.000

---

*Note.* The bolded item denotes sufficient sampling adequacy

Table 3.  
*Fit indices of the factors.*

No. of Factors	Parameter s	AIC	BIC	aBIC	RMSE A	CFI	TLI	SRM R
1 Factor	108	157704.19	158282.04	157938.95	0.135	0.56	0.53	0.12
		1	6	5		3	7	
2 Factors	143	152052.35	152817.48	152363.20	0.113	0.71	0.67	0.072
		7		2			4	
3 Factors	177	147867.09	148814.13	148251.84	0.092	0.81	0.78	0.05
			2	4		9	3	
4 Factors	210	145271.64	146395.25	145728.12	0.075	0.88	0.85	0.038
		3	1	9		7	6	
5 Factors	242	143511.94	144806.77	144037.99	0.06	0.93	0.90	0.029
		6	1	3		4	9	
<b>6 Factors</b>	<b>273</b>	<b>142155.17</b>	<b>143615.86</b>	<b>142748.60</b>	<b>0.042</b>	<b>0.97</b>	<b>0.95</b>	<b>0.016</b>
		<b>2</b>	<b>3</b>	<b>5</b>			<b>5</b>	
7 Factors	303	141913.55	143534.76	142572.20	0.038	0.97	0.96	0.013
		9	5	4		7	3	
8 Factors	332	141723.27	143499.64	142444.95	0.034	0.98	0.97	0.012
		3	4	6		2		
9 Factors	360	141565.05	143491.23	142347.60	0.031	0.98	0.97	0.01
		3	8	1		7	6	
10 Factors	387	141487.89	143558.54	142329.13	0.028	0.99	0.98	0.009
		1						
....	....	....	....	....	....	....	....	....

*Note.* The bolded item denotes the factor selected with the best fitting values.

Table 4.

*Eigenvalues and percentage of total variance explained by the six factors.*

Factor	Initial Eigenvalues		Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings
	Total	% of Variance	Total	% of Variance	Total
1	13.690	38.029	13.336	37.043	9.580
2	4.195	11.654	3.790	10.529	4.835
3	2.426	6.740	2.103	5.841	11.088
4	1.606	4.462	1.310	3.639	8.678
5	1.381	3.837	1.002	2.782	8.513
6	1.300	3.612	.931	2.585	8.014

Table 5.  
*The factor structure of DERS.*

Item	Factors					
	1	2	3	4	5	6
DERS1	.334	.338	.566	.253	.220	<b>.666</b>
DERS2	.178	.120	<b>.812</b>	.101	.084	.441
DERS3	.492	.600	.043	<b>.720</b>	.495	.520
DERS4	.328	.347	.444	.277	.251	<b>.838</b>
DERS5	.428	.463	.336	.359	.332	<b>.874</b>
DERS6	.196	.172	<b>.818</b>	.120	.113	.424
DERS7	.328	.319	.636	.275	.255	<b>.756</b>
DERS8	.139	.082	<b>.739</b>	.036	-.053	.241
DERS9	.458	.474	.283	.384	.330	<b>.837</b>
DERS10	.275	.215	<b>.753</b>	.120	.082	.355
DERS11	<b>.766</b>	.448	.123	.356	.288	.360
DERS12	<b>.856</b>	.507	.191	.400	.387	.427
DERS13	.405	.526	.029	.501	<b>.893</b>	.346
DERS14	.408	.507	.086	<b>.878</b>	.500	.363
DERS15	.544	<b>.841</b>	.114	.513	.514	.430
DERS16	.579	<b>.826</b>	.125	.474	.517	.430
DERS17	.534	.385	.549	.158	.179	.331
DERS18	.372	.539	-.035	.482	<b>.881</b>	.311
DERS19	.459	.566	.041	<b>.811</b>	.573	.413
DERS20	.278	.458	.168	.461	<b>.804</b>	.281
DERS 21	<b>.905</b>	.567	.222	.410	.406	.436
DERS22	.399	<b>.714</b>	.385	.355	.375	.325
DERS23	<b>.775</b>	.611	.190	.364	.444	.405
DERS24	.307	.456	.184	<b>.735</b>	.439	.256
DERS25	<b>.890</b>	.515	.200	.368	.359	.397
DERS26	.422	.560	-.015	.480	<b>.887</b>	.340
DERS27	.393	.503	.072	<b>.896</b>	.496	.388
DERS28	.507	<b>.827</b>	.161	.487	.457	.399
DERS29	<b>.880</b>	.562	.205	.405	.389	.404
DERS30	.741	<b>.732</b>	.125	.419	.506	.449
DERS31	.455	<b>.750</b>	.117	.475	.502	.433
DERS32	.408	.515	.083	<b>.907</b>	.465	.396
DERS 33	.456	.671	-.047	.546	<b>.801</b>	.346
DERS34	.219	.307	<b>.682</b>	.234	.140	.318
DERS35	.493	<b>.797</b>	.108	.449	.558	.441
DERS36	.528	<b>.749</b>	-.013	.583	.662	.460

*Note.* The bolded values indicate the items selected for each factor

Table 6.  
*Correlations among the factors.*

Factor	1	2	3	4	5	6
1	-					
2	.638**	-				
3	.213**	.163**	-			
4	.446**	.588**	.082**	-		
5	.449**	.629**	.029**	.569**	-	
6	.478**	.507**	.405**	.427**	.394**	-

Note. \*\*  $p < 0.01$

Table 7.  
*Random starts values.*

Loglikelihood Seed	Initial Stage Starts
-80540.223	986875
-80540.223	930781
-80540.223	494115
-80540.223	286621
-80540.223	877429
-80540.223	349898
-80540.223	76337
-80540.223	414828
-80540.223	140987
-80540.223	368648
-80540.223	397213
-80540.223	465160
-80540.223	426708
-80540.223	665649
-80540.223	662162
-80540.223	271100

Table 8.

*Class enumeration results for the latent profile analysis.*

Model	Parameter	AIC	BIC	aBIC	Entropy	LMR	BLRT
1							
Profile	72	179446.345	179831.582	179602.855	n/a	n/a	n/a
<b>2</b>							$\leq$
<b>Profile</b>	<b>145</b>	<b>161370.447</b>	<b>162146.271</b>	<b>161.685.64</b>	<b>0.971</b>	<b>18188</b>	<b>0.001</b>
3							
Profile			Unidentified				
4							
Profile			Unidentified				

*Note.* Bolded values indicates the class profile with the best fitting values



Table 9.

*Class counts and proportions for latent classes.*

---

Latent Classes	Counts	Proportions
1	665	0.4271
2	892	0.5729

---

Table 10.

*Classification posterior probabilities.*

Class	1	2
1	0.99	0.01
2	0.006	0.994

Table 11.

*The global solution of the random starts results values.*

Loglikelihood Seed	Initial Stage Starts
-80540.223	986875
-80540.223	930781
-80540.223	494115
-80540.223	286621
-80540.223	877429
-80540.223	349898
-80540.223	76337
-80540.223	414828
-80540.223	140987
-80540.223	368648
-80540.223	397213
-80540.223	465160
-80540.223	426708
-80540.223	665649
-80540.223	662162
-80540.223	271100
....	....

Table 12.

*Fit indices for the enumerated factor mixture models.*

Model	Parameters	AIC	BIC	aBIC	Entropy
2 classes 1 factor	217	151474.031	152635.093	151945.734	0.94
2 classes 2 factors	218	147210.8	148746.398	147834.665	0.931
2 classes 3 factors	355	143431.718	145331.151	144203.397	0.906
2 classes 4 factors	421	141322.951	143575.519	142238.098	0.9
2 classes 5 factors	485	139871.328	142466.328	140925.594	0.903
<b>2 classes 6 factors</b>	<b>547</b>	<b>138725.015</b>	<b>141651.747</b>	<b>139914.054</b>	<b>0.917</b>

*Note.* The bolded items represent the hybrid structure with the best fit values

Table 13.

*Probability for the most likely class membership for 2 class, 6 factor FMM.*

Class	1	2
1	0.959	0.041
2	0.014	0.986

Table 14.

*Class counts for 2 class, 6 factor FMM.*

Class	Count	Proportion
Class 1	509	0.326
Class 2	1048	0.674

Table 15.

*Model Comparison of FA, LPA and FMM.*

Model	Description	Parameters	AIC	BIC	aBIC	Entropy
FA						
Model 1	1 Factor	108	157704	158282	157938.96	n/a
Model 2	2 Factors	143	152052	152818	152363.2	n/a
Model 3	3 Factors	177	147867	148814	148251.84	n/a
Model 4	4 Factors	210	145272	146395	145728.13	n/a
Model 5	5 Factors	242	143512	144807	144037.99	n/a
<b>Model 6</b>	<b>6 Factors</b>	<b>273</b>	<b>142155</b>	<b>143616</b>	<b>142748.61</b>	<b>n/a</b>
LPA						
Model 7	1 class	72	179446	179832	179602.86	n/a
<b>Model 8</b>	<b>2 classes</b>	<b>145</b>	<b>161370</b>	<b>162146</b>	<b>161.685.64</b>	<b>0.971</b>
EFMM						
Model 9	2 classes 1 factor	217	151474	152635	151945.73	0.94
Model 10	2 classes 2 factors	218	147211	148746	147834.67	0.931
Model 11	2 classes 3 factors	355	143432	145331	144203.4	0.906
Model 12	2 classes 4 factors	421	141323	143576	142238.1	0.9
Model 13	2 classes 5 factors	485	139871	142466	140925.59	0.903
<b>Model 14</b>	<b>2 classes 6 factors</b>	<b>547</b>	<b>138725</b>	<b>141652</b>	<b>139914.05</b>	<b>0.917</b>

*Note.* The bolded items denote the structure with the best fitting values under each model

Table 16.

*Model variations: 2-Class, 6-Factor FMM.*

	Description	Parameters	AIC	BIC	aBIC	Entropy
FMM	2 classes 6					
- 1	factors			Nonconvergence		
FMM	2 classes 6					
- 2	factors			Nonconvergence		
<b>FMM</b>	<b>2 classes 6</b>					
<b>- 3</b>	<b>factors</b>	<b>181</b>	<b>142844.309</b>	<b>143812.753</b>	<b>143237.7</b>	<b>0.864</b>
FMM	2 classes 6					
- 4	factors			Nonconvergence		

*Note.* The bolded items represent the best fitting structure of the hybrid model of DERS



Table 17.

*Class counts for FMM-1 2 class, 6 factors.*

Class	Count	Proportion
Class 1	743	0.477
Class 2	817	0.523

Table 18.

*Probability for the most likely class membership for the FMM-1 2-Class, 6 Factors.*

Class	1	2
1	0.962	0.038
2	0.040	0.960

Table 19.

*Mean differences between the classes on psychopathology vulnerability.*

Psychiatric vulnerability	low-DERS class	high-DERS class	$X^2$ (1)	$p$ -Value
Emotion reappraisal	29.728 (0.322)	24.985 (0.262)	121.856	0.001
Emotion suppression	13.59 (0.272)	16.163 (0.216)	51.062	0.001
Positive affect	25.083 (0.431)	20.354 (0.275)	80.147	0.001
Negative affect	19.457 (0.344)	28.183 (0.318)	323.096	0.001
Anxiety Sensitivity (physical)	4.389 (0.248)	8.042 (0.239)	104.358	0.001
Anxiety Sensitivity (cognitive)	3.802 (0.246)	10.235 (0.257)	303.724	0.001
Anxiety Sensitivity (social)	7.835 (0.274)	12.434 (0.228)	155.335	0.001
Adverse life events	43.782 (1.550)	48.092 (1.288)	4.255	0.039

Table 20.

*Correlations between the (within-class) factors and psychopathology vulnerabilities.*

DERS Dimensions	Positive Affects	Negative Affects	Physical Concerns	Cognitive Concerns	Social Concerns	Anxiety Sensitivity
Nonacceptance	-.307**	.553**	.271**	.481**	.478**	.498**
Goals	-.296**	.470**	.267**	.451**	.288**	.409**
Impulsivity	-.258**	.533**	.293**	.469**	.313**	.437**
Awareness	-.387**	.240**	.074**	.205**	.245**	.211**
Strategies	-.429**	.632**	.351**	.579**	.421**	.548**
Clarity	-.335**	.425**	.204**	.372**	.313**	.359**

*Note.* \*  $p < 0.01$ ; \*\*  $p < 0.001$

Table 21.

*Measurement invariance: sex groups.*

Model	AIC	BIC	aBIC	Entropy
Configural	141354.117	143180.683	142094.232	0.896
Metric	141475.605	142917.63	142059.906	0.869
Scalar	141476.657	142534.142	141905.144	0.871
<b>Strict</b>	<b>141475.133</b>	<b>142527.278</b>	<b>141901.457</b>	<b>0.871</b>

*Note.* The bolded items represent the structure of the measurement invariance based on sex with the best goodness of fit values

Table 22.

*Measurement invariance: age groups.*

Model	AIC	BIC	aBIC	Entropy
Configural	114218.319	116713.533	115163.437	0.875
Metric	113639.842	115398.763	114306.073	0.894
<b>Scalar</b>	<b>113602.121</b>	<b>114624.749</b>	<b>113989.464</b>	<b>0.885</b>
Strict	113651.99	114664.392	114035.46	0.879

*Note.* The bolded items represent the structure of the measurement invariance based on age with the best goodness of fit values

Table 23.

*Measurement invariance: ethnic groups.*

Model	AIC	BIC	aBIC	Entropy
Configural	131081.277	133650.465	132100.258	0.867
Metric	130418.975	132230.042	131137.272	0.863
Scalar	130344.639	131397.585	130762.254	0.859
<b>Strict</b>	<b>130341.562</b>	<b>131383.978</b>	<b>130755</b>	<b>0.858</b>

*Note.* The bolded items represent the structure of measurement invariance based on ethnicity with the best goodness of fit values

Table 24.

*Effects of covariates on emotion regulation class membership.*

Covariates	Estimate	S.E.	Est./S.E.	Two-tailed <i>p</i> -Value
Sex	0.186	0.167	1.116	0.264
Age	0.057**	0.008	7.285	0.001
Ethnicity	-0.013	0.05	-0.266	0.79
Education	0.19**	0.042	4.558	0.001
Adverse life events	-0.002**	0.002	-2.605	0.009

*Note.* Reference group: Class 2: \*\*  $p < 0.001$



Table 25.

*Odd ratios for the effects of covariates on emotion regulation class membership.*

	OR	S.E.	Lower 2.5%	Upper 2.5%
Sex	1.205	0.201	-0.869	1.671
Age	1.059*	0.008	1.043	1.075
Race	0.987	0.05	-0.894	1.089
Edu	1.209*	0.05	1.114	1.312
Adverse life events	0.994*	0.002	0.99	0.999

*Note.* Reference: Class 2: \* $p < 0.01$

Table 26.

*Between class differences on the levels of emotion regulation difficulties.*

Dimensions of DERS	<i>M(S.E.)</i>		$X^2 (1)$	<i>p</i>
	low-DERS group	high-DERS group		
Non acceptance	11.433 (0.226)	19.706 (0.207)	677.339	0.001
Goals	13.381 (0.204)	19.443 (0.141)	558.447	0.001
Impulsiveness	9.484 (0.150)	15.599 (0.177)	641.097	0.001
Awareness	14.009 (0.216)	17.001 (0.169)	110.237	0.001
Clarity	9.63 (0.143)	14.005 (0.140)	439.868	0.001
Strategy	14.773 (0.244)	26.333 (0.214)	1187.472	0.001

Table 27.

*Between-class differences on (continuous) symptoms of psychopathology.*

Psychopathology Symptoms	<i>M(S.E.)</i>		$X^2 (1)$	<i>p</i> -Value
	low-DERS group	high-DERS group		
Depression	12.663 (0.423)	25.544 (0.373)	484.999	0.001
Anxiety	32.456 (0.421)	43.03 (0.389)	315.618	0.001
Borderline Personality disorder	3.095 (0.127)	5.901 (0.091)	301.454	0.001

Table 28.

*Differentiation of psychopathology symptoms based on the dimensions DERS.*

Level of DERS	Class	Psychopathology Symptoms					
		Depression		Anxiety		Borderline	
		Estimate	<i>p</i> -Value	Estimate	<i>p</i> -Value	Est.	<i>p</i> -Value
Non-Acceptance	Class1	0.024	0.329	-0.031*	0.038	-0.014	0.43
	Class2	0.037*	0.001	0.042*	0.001	-0.404*	0.001
Goals	Class 1	0.208*	0.001	0.014*	0.009	0.039*	0.001
	Class2	0.217*	0.001	0.113*	0.001	0.111*	0.001
Impulsiveness	Class1	0.124*	0.001	0.106*	0.001	0.014	0.522
	Class2	0.088*	0.001	0.178*	0.001	0.098*	0.001
Awareness	Class 1	0.002	0.868	0.001	0.864	0.006	0.409
	Class2	-0.014*	0.047	0.01	0.132	0.018*	0.021
Clarity	Class1	0.045	0.057	-0.004	0.724	0.011	0.481
	Class2	0.024*	0.005	0.043*	0.001	0.058*	0.001
Strategy	Class 1	0.119*	0.001	-0.004	0.689	0.095*	0.001
	Class2	0.067*	0.001	0.07*	0.001	0.158*	0.001

*Note.* \* $p < 0.01$

Table 29.

*Prediction of the level of depression symptoms by the category of DERS class.*

	Diagnostic Category	Probability	S.E.	Odd ratio	S.E.	2.50%	97.50%
Class 1	Normal	0.459	0.029	1	0	1	1
	Mild	0.253	0.02	0.321*	0.069	0.211	0.49
	Borderline	0.139	0.017	0.216*	0.054	0.133	0.352
	Moderate	0.123	0.018	0.058*	0.014	0.037	0.091
	Severe	0.026	0.009	0.02*	0.008	0.009	0.043
	Extreme	0	0	0	0	0	0
Class 2	Normal	0.077	0.01	1	0	1	1
	Mild	0.132	0.013	1	0	1	1
	Borderline	0.108	0.011	1	0	1	1
	Moderate	0.358	0.016	1	0	1	1
	Severe	0.217	0.014	1	0	1	1
	Extreme	0.107	0.01	1	0	1	1

*Note.* \*  $p < 0.01$

Table 30.

*Prediction of borderline personality disorder symptoms by the category of DER class.*

	Diagnostic Category	Probability	S.E.	Odd ratio	S.E.	2.50%	97.50%
Class 1	No	0.873	0.019	1	0	1	1
	Yes	0.127	0.019	0.171	0.032	0.119	0.247
Class 2	No	0.541	0.017	1	0	1	1
	Yes	0.459	0.017	1	0	1	1

Table 31.

*Prediction of the level of anxiety symptoms by the category of DERS class.*

	Diagnostic Category	Probability	S.E.	Odd ratio	S.E.	2.50%	97.50%
Class 1	Normal	0.404	0.025	1	0	1	1
	Mild	0.347	0.022	0.268*	0.052	0.183	0.392
	Moderate	0.177	0.018	0.113*	0.023	0.075	0.169
	Severe	0.071	0.014	0.031*	0.008	0.018	0.052
Class 2	Normal	0.073	0.01	1	0	1	1
	Mild	0.233	0.015	1	0	1	1
	Moderate	0.283	0.015	1	0	1	1
	Severe	0.411	0.018	1	0	1	1

*Note.* \*  $p < 0.01$

Figure 1.

*The factor structure of emotion regulation difficulties*

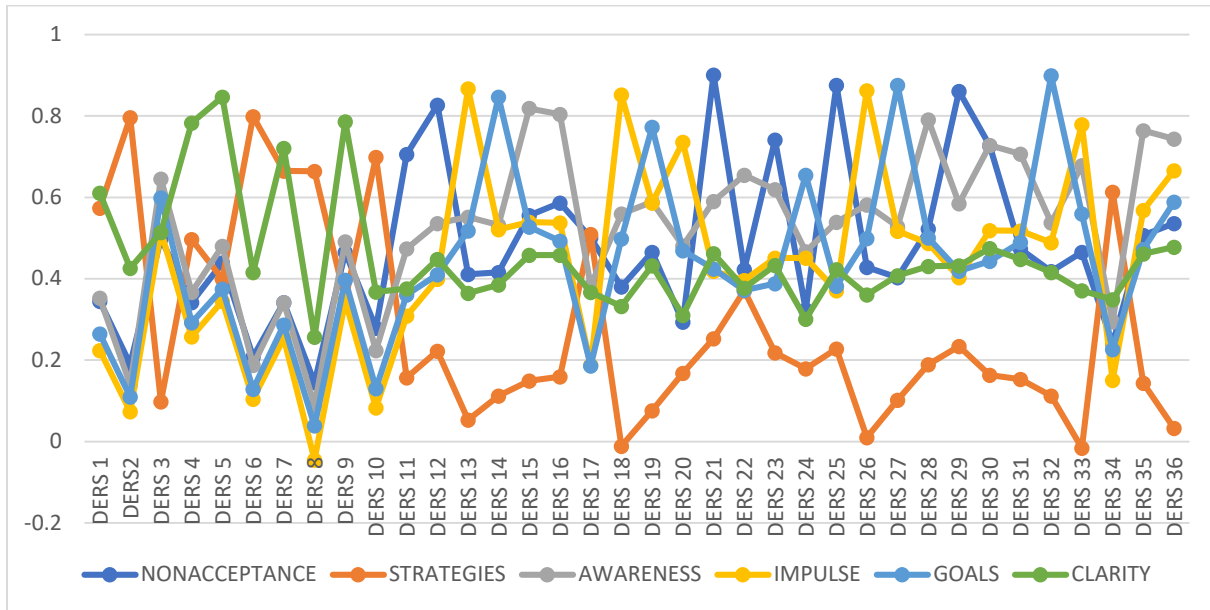




Figure 2.

*Profile of emotion regulation difficulties*

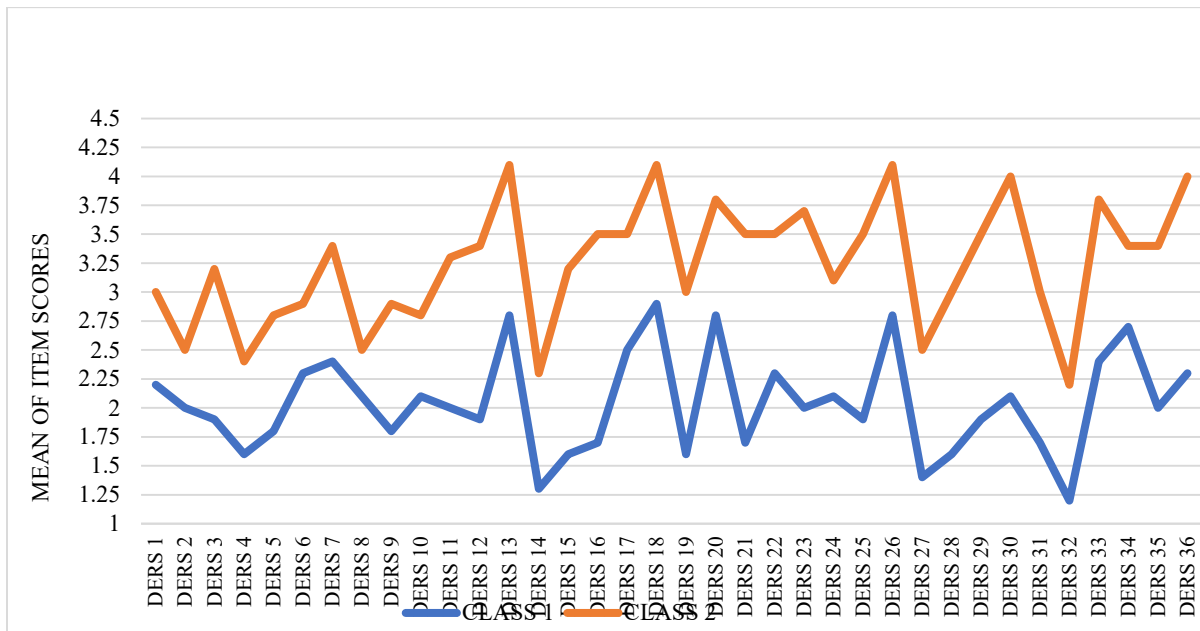
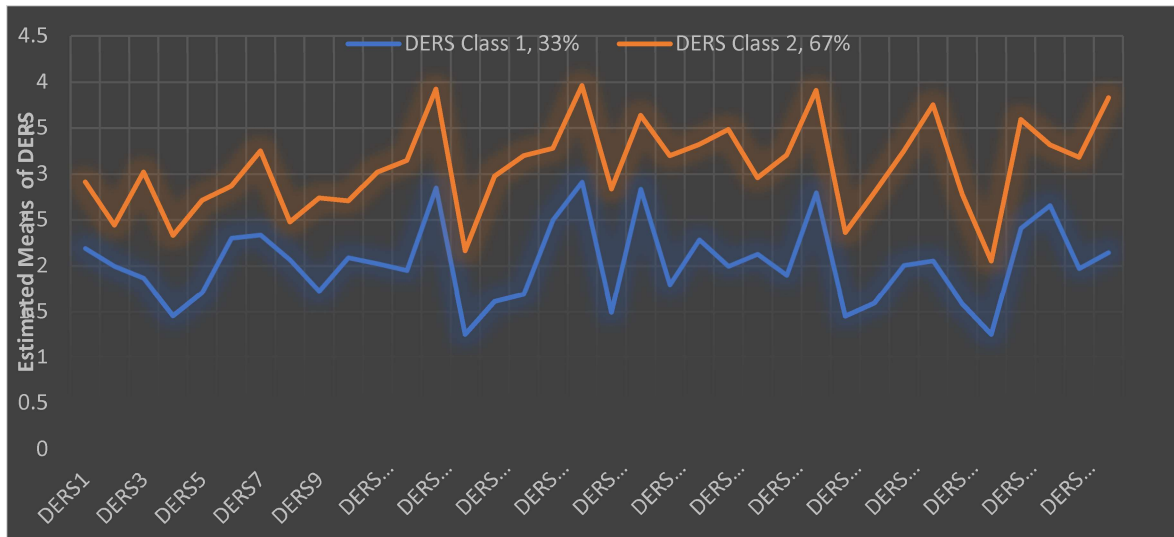


Figure 3.

*Profile of the 2 class, 6 factor FMM model of emotion regulation difficulties*



## VITAE

**Enoch T. Sackey, M.A.**  
Curriculum Vitae  
Updated August 2021

Department of Psychology  
302E Peabody Hall  
P.O. Box 1848  
University, MS 38677-1848

Email: [enoch247gh@gmail.com](mailto:enoch247gh@gmail.com)

---

---

### EDUCATION

Doctor of Philosophy Clinical Psychology (Anticipated, 2022)	University of Mississippi, Department of Psychology, Oxford, MS <i>Accredited by APA</i> Dissertation Title: “Testing Emotion Regulation as a Functional Transdiagnostic Vulnerability in Anxiety- and Mood-Related Symptoms.” Dissertation Chair: Danielle J. Maack, Ph.D.
Predocutorial Internship (Anticipated, 2022)	The Charleston Consortium (Medical University of South Carolina [MUSC] and Ralph H. Johnson Veterans Affairs Medical Center [VAMC]), Charleston, SC Tracks: Behavioral Medicine and Trauma Preceptors: Rosaura Orenge-Aguayo, PhD; Regan Stewart, PhD
Certificate in Applied Statistics 2019	University of Mississippi, Department of Mathematics and Statistics
Master of Arts 2013	Norwegian University of Science and Technology, Department of Psychology, Trondheim Thesis Title: “Children Balancing Work with School: A Sociocultural Conception of Child Work and Schooling in Ghana.” Thesis Chair: Berit O. Johannesen, Ph.D.
Bachelor of Science 2009	University of University of Cape Coast, Ghana Major: Psychology

---

---

### RESEARCH GRANTS

2013	Norwegian Government Research Grant [ <u>\$6,000.00</u> ]
2014	International Research Grant in Psychology, Norwegian University of Science Technology [ <u>\$2,500.00</u> ]

---

---

## FELLOWSHIPS AND AWARDS

2011	Norwegian Quota Scholarship Scheme for Developing Countries
2010	Asmona Award for Best Graduating Student, University of Cape Coast
2010	Undergraduate Best Student Award, University of Cape Coast
2009	University of Cape Coast, Dean's Graduate Fellowship

---

---

## CLINICAL EXPERIENCE

### Practicum Experiences

Aug 2021- Present	<b>National Crime Victims Research and Treatment Center (NCVC), Medical University of South Carolina</b> <i>Supervisors:</i> Michael de Arellano, Ph.D., Regan W. Stewart, PhD., & Rosaura Orengo-Aguayo, Ph.D. <i>Experiences:</i> Trauma Focused CBT (TF-CBT); Prolonged Exposure (PE); Cognitive Processing Therapy (CPT); Parent-Child Interaction Therapy (PCIT); Skills for Psychological Recovery (SPR); Intensive Case Management for underserved youth and families; Delivery of services via interpreters. <i>Population:</i> Children, adolescents, adults, and families who have experienced a traumatic event (e.g., sexual/physical abuse, homicide survivors, witnessed/experienced IPV, etc.) with PTSD or traumatic stress related symptoms.
Aug 2021- Present	<b>Weight Management Center, Medical University of South Carolina</b> <i>Supervisor:</i> Patrick M. O'Neil, Ph.D. <i>Experiences:</i> Cognitive Behavioral Therapy; Motivational Enhancement Therapy; Behavior Modification Strategies; Eating Disorders Assessment <i>Population:</i> Adults experiencing overweight and obesity problems, eating disorders and co-occurring mental health problems.
2015-2021	<b>Psychological Services Center, University of Mississippi, Oxford MS</b> <i>Supervisor:</i> Laura Johnson, Ph.D., John Young, PhD. & Danielle Maack, PhD. <i>Experiences:</i> Individual psychotherapy (CBT, ACT, DBT, etc.) for adults experiencing psychological problems; development of treatment planning and treatment progress notes; provision of peer supervision and attendance of weekly supervision meetings. <i>Population:</i> Children and adults presenting with various psychological problems and related physical health issues.
2018-2020	<b>St. Jude Children's Research Hospital, Memphis, TN</b> <i>Supervisors:</i> Jerlym Porter, PhD. <i>Experiences:</i> Co-facilitation of skills training for children and adolescents with sickle cell disease transitioning from pediatric to adult healthcare. <i>Population:</i> Children and adolescents (ages 6-18) with sickle cell disease presenting with deficits in adaptive transition skills
2017-2020	<b>Willow Pain and Wellness, LLC, Oxford, MS</b> <i>Supervisors:</i> John Young, PhD. <i>Experiences:</i> Administration of psychological assessments to determine diagnostic status to inform pain management, osteopathic manipulative medicine, and behavioral interventions; integration of assessment results and pertinent data to inform psychoeducational and assessment reports. <i>Population:</i> Adults experiencing chronic pain and psychiatric comorbidities.

- 2017-2020 **Oxford Obstetrics and Gynecology Associates, Oxford, MS**  
Supervisor: Danielle Maack, Ph.D.  
Experiences: Administration of psychoeducational and diagnostic evaluations to determine psychological and diagnostic status to inform mental health and behavioral intervention needs of patients. Training in Parent Child Interaction Therapy (PCIT), individual therapy with children, and family therapy.  
Population: Prenatal and antenatal care patients; children and their parents.
- 2018-2020 **Community Outreach and Diversity Initiative Program, University of Mississippi, Oxford, MS**  
Supervisor: Todd Smitherman, Ph.D.  
Experiences: Implementation and coordination of training activities relating to health promotion in rural communities in the Mississippi Delta area; facilitation of educational initiatives towards recruiting minority students into undergraduate colleges and graduate school programs.  
Population: Individuals in underserved and outlying communities.
- 2015-2020 **University of Mississippi Office of International Programs, Oxford MS**  
Supervisor: Laura Johnson, Ph.D.  
Experiences: Facilitation of open environment to encourage the discussion of acculturation issues (e.g., acculturative stressors, homesickness, etc.) among international students; assistance with organization of events that foster students' positive experiences of cultural exchange at the university and in the local community.  
Population: College students; international students.
- 2017-2019 **North Mississippi Regional Center, Oxford, MS**  
Supervisors: Stefan Schulenberg, Ph.D. & Tom Moore, Ph.D.  
Experiences: Training in the administration, scoring and interpretation of: Minnesota Multiphasic Personality Inventory (MMPI); Mini-International Neuropsychiatric Interview (MINI); Wechsler Adult Intelligence Scale (WAIS); Wechsler Intelligence Scale for Children (WISC); Wechsler Abbreviated Scale of Intelligence (WASI); Wide Range Achievement Test (WRAT); Woodcock-Johnson Tests of Achievement; Wechsler Memory Scale (WMS); Trail-Making Test; Stroop Task.  
Population: Adults and adolescents with developmental and intellectual disabilities.
- 2018- 2019 **Community Mental Health Center (Communicare), Oxford Mississippi**  
Supervisor: Todd Smitherman, Ph.D.  
Experiences: Training and clinical experience with Interpersonal Psychotherapy, Motivational Interviewing, Cognitive Behavioral Therapy, Behavioral Activation, Acceptance and Commitment Therapy, Functional Analytic Psychotherapy  
Population: Adults with depression and anxiety, Axis II diagnoses, suicidal ideation, interpersonal difficulties, health concerns, physical disabilities, and chronic pain.
- 2016-2019 **University of Mississippi Psychological Assessment Team, Oxford, MS**  
Supervisors: Scott Gustafson, Ph.D.  
Experiences: Training in the administration, scoring and interpretation of: Minnesota Multiphasic Personality Inventory (MMPI); Mini-International Neuropsychiatric Interview (MINI); Wechsler Adult Intelligence Scale (WAIS); Wechsler Intelligence Scale for Children (WISC); Wechsler Abbreviated Scale of Intelligence (WASI); Wide Range Achievement Test (WRAT); Wechsler Memory Scale (WMS)  
Population: Individuals with developmental and intellectual disabilities; college students.
- 2017-2019 **LGBTQIA+ Group, University of Mississippi, Oxford, MS**

Supervisor: Laura Johnson, Ph.D.

Experiences: Co-facilitation of an LGBTQ+ group on university campus enhancing adaptive processing and functioning among sexual and gender minority individuals.

Population: Sexual and gender minority individuals; college students.

2016-2017

**The Baddour Center, Senatobia, MS**

Supervisor: Shannon Hill, Ph.D.

Experiences: Individual and group therapy with adults and adolescents with developmental and intellectual disabilities; adaptive and functional behavior assessments and psychoeducational evaluations; cognitive and behavioral diagnostic evaluations, e.g., administration, scoring, and interpretation of the Wechsler Adult Intelligence Scale (WAIS), Abbreviated Scale of Intelligence (WASI), and Wide Range Achievement Test (WRAT).

Population: Adolescents and adults diagnosed with developmental and intellectual disabilities.

2005-2010

**Community Outreach Program, Global Volunteers Project, Cape Coast, Ghana**

Supervisor: Eric Essuah, M. A., MBA

Experiences: Implementation and coordination of community outreach programs for local and international organizations, including USAID, UNCHR, and WHO, to increase HIV/AIDS awareness and healthcare access in rural communities in Ghana and Togo.

Population: Community-based children and adolescents; foster care children; community-based adults.

---

---

**RESEARCH EXPERIENCE**

2015-2021

**Pregnancy Initiative and Healthcare Access** (*under the direction of Danielle Maack, Ph.D.*)

**Research Assistant, University of Mississippi**

The study examines how women's understanding of pregnancy and antenatal care is influenced by their cultural context in low-income settings, where women may have limited influence over their reproductive health, including when to seek health care.

Responsibilities: Administration of clinical diagnostic instruments, self-report measures; facilitation of cognitive and behavioral interventions; dissemination of results to patients and their physicians; facilitation of partnerships with obstetrics and gynecology clinics.

2016-2021

**Health Disparities in Nonpharmacologic Therapies among Chronic Pain Patients** (*under the direction of John Young, Ph.D.*)

**Research Assistant, University of Mississippi**

The study examines how chronic pain impacts low-income individuals and their communities. The involves working with individuals experiencing overuse of prescription opioids for chronic pain, but having limited access to nonpharmacologic treatments in low-income, racially and ethnically diverse settings. The project seeks to disseminate and provide mental health care and access to individuals with chronic pain and psychiatric comorbidities.

Responsibilities: Chronic pain assessment and psychopathology intervention development and refinement; analysis of data.

- 2015-2021 **Disgust Optimization and Affective Disorders Research** (*under the direction of Danielle Maack, Ph.D.*)  
**Research Assistant, University of Mississippi**
- The research study examines disgust constructs, their involvement in psychopathology, and methods for intervention. The study specifically explores four principal domains of disgust: core disgust, contamination disgust, animal reminder disgust, and moral disgust and how each of these higher-order factors has been associated with unique eliciting stimuli, as well as behavioral, physiological, and clinical features that are involved in the development and maintenance of psychopathology.
- Responsibilities:* Administration of self-report measures, behavioral avoidance tasks, and information processing tasks to capture the complex emotional and behavioral qualities of disgust; assessment of disgust-related constructs including measures of state disgust, trait disgust, and symptom-specific disgust cues.
- 2016-2021 **Ecology and Youth in Tanzania Study** (*Under the supervision of Laura Johnson, Ph.D.*)  
**Research Assistant, University of Mississippi**
- This study, funded by the US Fulbright grants for research in East Africa and the National Geographic Conservation Trust, investigates developmental assets profiles of youth in Tanzania and recommend actions for environmental intervention, peace, and integration of primary and traditional care for depression. The project spans cultural, conservation and peace psychology with a focus on positive youth development, community participation, and intercultural relations in a changing global environment.
- Responsibilities:* Analysis of quantitative and qualitative data; manuscript preparation.
- 2020-2021 **Testing Emotion Regulation as a Functional Transdiagnostic Construct in Anxiety- and Mood-Related Disorders** (*Dissertation study overseen by Danielle Maack, PhD. & John Young, Ph.D.*)  
**Principal Investigator, University of Mississippi**
- Exploration of emotion regulation problems as a functional transdiagnostic vulnerability in anxiety- and mood-related disorders. The study aims to expand on the conceptual framework for modeling the functional relations between psychosocial and cultural factors and psychiatric comorbidities.
- Responsibilities:* Conceptualization of study; training and supervision of facilitators and research assistants; data collection and analyses; manuscript preparation.
- 2019-2021 **Transition Process from Pediatric Care to Adult Care for Patients with Sickle Cell Disease** (*under the direction of Jerlym Porter, Ph.D.*)  
**Research Assistant, St. Jude Children's Research Hospital**
- This is a longitudinal study comprising experts from multi-country (the USA, Europe, Middle East, and Africa) consortia working together towards the development of appropriate benchmarking for sickle-cell disease transition programming. The study involves highlighting priorities to consider for any young person with sickle cell disease transitioning from pediatric to adult health care: skills transfer, increasing self-efficacy, coordination, knowledge transfer, linking to adult services, and evaluating readiness.
- Responsibilities:* Coordination of partnership with research consortiums; administration of semi-structure interviews and self-report measures; analysis of preliminary data.

- 2019-2021 **Psychosocial Factors Impacting Health Promotion, Treatment Adherence and Disease Management among Sickle Cell Patients** (*under the direction of Jerlym Porter, Ph.D.*)  
**Research Assistant, University of Mississippi**
- This is a study evaluating the use of the AdhereTech smart bottle in pediatric patients on hydroxyurea (HU) therapy for sickle cell disease. Equipped with an electronic medicine dispenser with a wireless tracking and reminder system, the bottle records when medication is removed, and the amount of medication removed. The aim of the study is to provide data necessary to support the utilization of this electronic system to objectively measure disease outcomes and correlates of HU adherence over time.
- Responsibilities:* Community outreach; implementation and dissemination of intervention; data collection and analysis, and manuscript preparation.
- 2019- 2021 **Psychosocial Impact of Disclosing Cancer Predisposition Genetic Testing** (*under the direction of Katianna Sharp, Ph.D.*)  
**Research Assistant, St. Jude Children’s Research Hospital**
- The study examines the impact of genetic testing result disclosure on parent adjustment (i.e., emotional functioning, cancer worry, symptom interpretation, and genetic testing related worry/distress) and parenting (i.e., responses to children’s symptoms, overprotectiveness, parent-child communication, cohesion and expressivity in the family).
- Responsibilities:* Administration of semi-structured interviews and self-reports measures to parents of children undergoing genetic testing for cancer predisposition; dissemination of results to families.
- 2016– 2021 **In the Faces of the Mountain Study** (*under the direction of Laura Johnson, Ph.D.*)  
**Research Assistant, University of Mississippi**
- The project, funded by the National Geographic Conservation Trust and a University of Mississippi Scholar Research Grant, involves collaboration with partners from the Jane Goodall Institute and forest villages in Tanzania. The research study seeks to bring visibility and voice to conservation initiatives in the regions in Tanzania facing numerous ecological threats. The project is centered around the use of Photovoice for forest conservation on Mt. Kilimanjaro.
- Responsibilities:* Coordination of data collection; training of research facilitators; supervision of research assistants; data collection and analysis.

## PUBLICATIONS

1. Hamer, J. D., **Sackey, E. T.**, Maack, D. J., & Smitherman, T. A. (2020). Development of a measure to assess acceptance of headache: The Headache Acceptance Questionnaire (HAQ). *Cephalalgia*, 40(8), 797-807.
2. Johnson, L. R., Johnson-Pynn, J. S., Drescher, C. F., **Sackey, E.**, & Assenga, S. (2019). Predicting civic competencies among East African youth and emerging adults: Report on the Swahili General Self-Efficacy Scale. *Emerging Adulthood*, 7(4), 309-314.
3. **Sackey, E. T.**, & Johannesen, B. O. (2015). Earning identity and respect through work: A study of children involved in fishing and farming practices in Cape Coast, Ghana. *Childhood*, 22(4), 447-459.



## MANUSCRIPTS IN PREPARATION

4. **Sackey, E. T.**, Stewart, R. W., Young, J., & Orengo-Aguayo, R. (in preparation). Disaster exposure and mental health among Puerto Rican teachers after Hurricane Maria.
  5. Sharp, K. M. H., Li C., Lu Z., Clark, M. E., **Sackey, E. T.**, Jurbergs, N., Ouma, A., Harrison, L., Gerhard, E. & Johnson, L. (in preparation). Parent sequencing-related adjustment following disclosure of pediatric oncology next generation sequencing results.
- 

## RESEARCH PRESENTATIONS

1. Plage L. L., **Sackey, E. T.**, Maack, D. J. (2019). *The effect of race on antenatal depression and anxiety*. University of Mississippi Conference on Psychological Science, Oxford, MS.
2. **Sackey, E. T.** & Maack D. J (2019). *Examination of emotion regulation as a functional transdiagnostic construct in affective disorders*. University of Mississippi Conference on Psychological Science, Oxford, MS.
3. Johnson, L. R., Kibanja, G., **Sackey, E. T.**, Drescher, C. Marsh, R., & Malindi, M. (2018). *Positive Youth Development: Pathway to Sustaining Peace in Tanzania*. Caribbean Regional Psychology Conference, Kingston, Jamaica.
4. **Sackey, E. T.** & Hooks, C. N. Johnson, L. R. (2018). *Peeling the layers of HIV/AIDS stigma*. Poster presented at annual Southeastern Psychological Association (SEPA) Meeting, Charleston, SC.
5. **Sackey, E. T.** & Maack D. J (2018). *Individual Differences in Psychopathology*. University of Mississippi Conference on Psychological Science, Oxford, MS.
6. Williams C. K. **Sackey, E. T.** & Maack, D. J. (2018). *Headache Experience and Difficulties in Emotion Regulation*. University of Mississippi Conference on Psychological Science, Oxford, MS.
7. Johnson, L. R., Johnson- Pynn, J., **Sackey, E. T.**, Dresher, C. & Marsh, M. J. (2017). *Support for Self-Efficacy in Tanzania: Swahili Version of the General Self Efficacy Scale*. Poster presented at annual Southeastern Psychological Association (SEPA) Meeting, Charleston, SC.
8. Hooks, C. N., **Sackey, E. T.**, Lair, E. C., & Gross, A. M. (2017). *Relationships between sexual sensation seeking, location-based social networking, and sexual-risk among men who have sex with men*. Poster presented at the annual GSC 7th Annual Research Symposium, University of Mississippi, Oxford, MS.
9. Hooks, C. N., **Sackey, E. T.**, Lair, E. C., & Gross, A. M. (2017, February). *Geosocial networking and risky sex among men who have sex with men*. Poster presented at the annual Mississippi Academy of Sciences Meeting, Hattiesburg, MS.
10. **Sackey, E. T.** & Hooks, C. N., Johnson, L. R. (2017). *Exploration of factors that underpin meaningful study abroad experience*. Poster presented at annual Southeastern Psychological Association (SEPA) Meeting, Charleston, SC.

11. **Sackey, E. T.** (2014). *Children Balancing Work with School: A Sociocultural Conception of Child Work and Schooling in Cape Coast Metropolitan Area, Ghana*. International Conference on Social and Community Psychology, Lund, Sweden.
12. **Sackey, E. T. & Johannesen, B. O.** (2013). *Adjustment of Pregnant Adolescents in Rural Schools in Ghana*. International Conference of Social and Community Psychology, Trondheim Norway.
13. **Sackey, E. T.** (2013). *Socio-Cultural Determinants of the Health of Pregnant Adolescents in Ghana: A Focus on Social Stressors in the Development of Maternal Mortality Interventions in Ghana*. International Conference on Social and Community Psychology, Trondheim, Norway.

### **SUPERVISION EXPERIENCE**

- 2017-2018      **CBT Supervision and Consultation**  
*Supervisor:* John Young, Ph.D.  
*Experiences:* Facilitation of training in conducting cognitive and behavioral therapy with fidelity and competency; conduct ongoing supervision of group facilitation skills  
*Population:* Second year clinical psychology graduate students
- 2018-2019      **Assessment Supervision and Consultation**  
*Supervisor:* Danielle Maack, Ph.D.  
*Experiences:* Training and supervision of first year graduate students in administering, scoring, and interpreting psychological tests (e.g., WAIS-IV, WIAT-IV, WRAT, WMS-IV); performing clinical interviews; writing psychological reports; and providing client feedback.  
*Population:* First year clinical psychology graduate students.

### **WORKSHOP FACILITATION EXPERIENCE**

- 2018              Co-facilitation of pre-departure and post-arrival workshop for study abroad students at the Croft Institute of International Studies with Dr. Laura Johnson.
- 2017              Co-facilitation of intercultural communication and acculturative processes workshop for (first time) study abroad students at the Croft Institute of International Studies with Dr. Laura Johnson.
- 2016              Co-facilitation of a one-week behavioral modification strategies training for Direct Support Professionals at group homes at the Baddour Center.

### **ADVANCED CLINICAL TRAINING EXPERIENCES**

- |      |      |   |
|------|------|---|
| Sept | 2021 | <i>Prolonged Exposure 3-day training</i><br>Medical University of South Carolina,                           |
| Aug  | 2021 | <i>Trauma-Focused CBT, MUSC 3-day Training</i><br>Medical University of South Carolina                      |
| Jan  | 2019 | <i>Motivational Interviewing (MI) Workshop</i><br>University of Mississippi,<br>John Young, Ph.D.           |
| Aug  | 2019 | <i>Acceptance and Commitment Therapy (ACT) Workshop</i><br>University of Mississippi<br>Kelly Wilson, Ph.D. |

- Aug 2018 *Unified Protocol for the Treatment of Emotional Disorders*  
University of Mississippi  
John Young, Ph.D.
- Nov 2018 *Couples Therapy*  
University of Mississippi  
Danielle Maack, Ph.D.
- Aug 2017 *Cognitive Behavioral Therapy*  
University of Mississippi
- 
- 

## **TEACHING EXPERIENCE**

- Fall 2019 Graduate Instructor for Statistics
- Spring 2020 Graduate Instructor for Statistics
- Spring 2019 Graduate Instructor for Research Methods
- Fall 2018 Graduate Instructor for Research Methods
- Fall 2016 Teaching Assistant for Multicultural Psychology
- 
- 

## **CERTIFICATIONS**

- Certificate in Applied Statistics
- APA Training Certification in Telepsychology Best Practices
- National Register Associate Certificate Program; Clinical Suicidology
- Provisionally Certified Mental Health Therapist (PCMHT)
- 
- 

## **PROFESSIONAL AFFILIATIONS**

- Association for Behavioral and Cognitive Therapies (ABCT)
- Southeastern Psychological Association (SEPA)
- Mississippi Psychological Association (MPA)