

STEPS TOWARDS A UNIFIED THEORY OF PSYCHOPATHOLOGY: THE PHASE SPACE OF MEANING MODEL

Claudia Venuleo, Giampaolo Salvatore, Ruggero Andrisano Ruggieri, Tiziana Marinaci,
Mauro Cozzolino, Sergio Salvatore

OPEN ACCESS

Abstract

The hypothesis of a general psychopathology factor (p factor) has been advanced in recent years. It is an innovation with breakthrough potential, in the perspective of a unified view of psychopathology; however, what remains a controversial topic is how its nature might be conceptualized. The current paper outlines a semiotic, embodied and psychoanalytic conceptualization of psychopathology – the Phase Space of Meaning (PSM) model – aimed at providing ontological grounds to the p factor hypothesis. Framed within a more general model of how the mind works, the PSM model maintains that the p factor can be conceived as the empirical marker of the degree of rigidity of the meaning-maker's way of interpreting experience, namely of the dimensions of meanings used to map the environment's variability. As to the clinical implications, two main aspects are outlined. First, according PSM model, psychopathology is not an invariant condition, and does not have a set dimensionality, but is able to vary it locally, in order to address the requirement of situated action. Second, psychopathology is conceived as one of the mind's modes of working, rather than the manifestation of its disruption. Finally, the puzzling issue of the interplay between stability and variability in the evolutionary trajectories of patients along with their life events is addressed and discussed.

Key words: psychopathology, p factor, semiotic and psychoanalytic theory, Phase Space of Meaning model, rigidity

Claudia Venuleo¹, Giampaolo Salvatore², Ruggero Andrisano Ruggieri³, Tiziana Marinaci¹, Mauro Cozzolino³, Sergio Salvatore⁴

¹ Department of History, Society, and Human Studies, University of Salento, Lecce, Italy.

² Center for Metacognitive Interpersonal Therapy, Salerno, Italy.

³ Department of Human, Philosophical and Training Sciences, University of Salerno, Salerno, Italy.

⁴ Department of Dynamic and Clinical Psychology, University La Sapienza, Rome, Italy.

Citation: Venuleo, C., Salvatore, G., Ruggieri, R.A., Marinaci, T., Cozzolino, M., Salvatore, S. (2020). Steps towards a unified theory of psychopathology: The Phase Space of Meaning model. *Clinical Neuropsychiatry*, 17(4), 236-252.

doi.org/10.36131/
cnfioritieditore20200405

Copyright: © Clinical Neuropsychiatry
This is an open access article. Distribution and reproduction are permitted in any medium, provided the original author(s) and source are credited.

Funding: None.

Competing interests: Authors have no disclosures, and they have no affiliation with or financial interest in any organization that might pose a conflict of interest.

Corresponding author

Claudia Venuleo
Department of History, Society, and Human Studies, University of Salento, Lecce, Italy
E-mail: claudia.venuleo@unisalento.it

1. Introduction

The debate on how psychopathology can be defined and explained is far from over (Maddux, Gosselin, & Winstead, 2012). Any attempt to provide a comprehensive account of the criteria which have been suggested for the correct definition of the term will inevitably be not satisfying and merely an incomplete outline. Stein and colleagues (2010) observed that the American Psychiatric Association, in introducing the DSM-IV notes "(...) although this manual provides a classification of mental disorders, it must be admitted that no definition adequately specifies precise boundaries for the concept". Different terms have been advanced to define psychopathology – e.g., *social deviance* (Sedgwick, 1982) *abnormal behavior* (Coleman, 1950), *physical, mental or behavioral deviance* (Ausubel, 1971), *statistical deviance or infrequency* (Brenner, 1974; Cohen, 1981; Rosenhan & Seligman, 1995), *harmful dysfunction* (Wakefield, 1992), *developmental deviance* (Cicchetti, 1989), *psychobiological dysfunction* (American Psychiatric Association, 2013). However, none of these criteria has been consensually recognized as constituting psychopathology (see:

Bergner, 1997; Maddux, Gosselin, & Winstead, 2012). The concept of psychopathology is actually a Roschian concept (Lilienfeld & Marino, 1995) characterized by intrinsically fuzzy boundaries.

The lack of consensus leads to very critical consequences, at scientific, clinical and socio-political levels (see: Bergner, 1997). At a scientific level, different theories – developed to provide scientific accounts of the same thing "psychopathology" – actually provide accounts of different phenomena (maladaptive behavior, intrapsychic conflict, etc.). At the level of clinical treatment, different theories suggest different conceptions of what has to change, and different conceptions of the ultimate goal interventions should pursue (e.g., to increase adaptive functioning; to reduce symptoms, to solve the conflict). Finally, at the socio-political level, the absence of consensus does not impede the misuse of the concept of psychopathology. For instance, some authors have highlighted conceptions of pathology as medical disease (Szasz, 1974) or as social deviance (Scheff, 1975; Sedgwick, 1982) have fomented stereotypes and legitimized social stigmatization and social control (Foucault, 1965/67; Goffman, 1963; Read & Harré, 2001).

Problems concerning the definition of psychopathology cannot avoid being reflected in the way its clinical manifestations are represented. The shortcomings of traditional taxonomies are well known. They include the untested assumption that mental disorders are categories; the arbitrary thresholds and associated loss of information; the heterogeneity of diagnoses and comorbidity among putatively distinct disorders (Caspi et al., 2014; Kotov et al., 2017; Krueger, Hopwood, Wright, & Markon, 2014; Widiger & Sankis, 2000). One way to overcome these shortcomings is the attempt to identify sub-types of a disorder – e.g., subtypes of depression (Drysdale et al., 2017; Papakostas, Fan, & Tedeschi, 2012), subtypes of narcissism (Levy, 2012), subtypes of bipolar disorders (Lenzenweger et al., 2008), subtypes of behavioral addictions (Mallorqui-Bagué et al., 2018), and to elaborate specific theories for specific forms of psychopathology. However, most of these subtypes also fail to demarcate homogeneous subgroups (Billieux, Schimmenti, Khazaal, Maurage, & Heeren 2015; Schimmenti, Carretti & La Barbera, 2014; Watson, 2003).

An alternative solution that responds to all the above shortcomings is emerging in the form of an empirically based organization of psychopathology (e.g., Achenbach & Rescorla, 2003; Forbush & Watson, 2013; Kotov et al., 2011; 2017; Krueger & Markon, 2011; Lahey et al., 2008; Vollebergh et al., 2001) grounded on the idea that psychopathology exists on a continuum with normal-range functioning. In this perspective, psychopathological constructs have a dimensional nature, namely different disorders and specific syndromes can be conceived as specific instantiations of a coherent underlying domain of human variation (Achenbach & Rescorla, 2003; Achenbach, Conners, Quay, Verhulst, & Howell, 1989; Carragher et al., 2014; Forbush & Watson, 2013; Krueger & Markon, 2006a; Røysamb et al., 2011; Slade & Watson, 2006). Factor analysis research has consistently identified three fundamental dimensions of common mental disorders – internalizing, externalizing (Krueger, 1999) and thought disorder spectrum (Kotov et al., 2011), which appear across numerous cultures and diagnostic systems (Krueger, Chentsova-Dutton, Markon, Goldberg, & Ormel, 2003), show stability longitudinally and developmentally (Vollebergh et al., 2001), and account for genetic and environmental relationships between disorders (Kendler, Prescott, Myers, & Neale, 2003).

On the basis of the observation that the internalizing and externalizing factors are themselves substantially correlated with each other (Achenbach et al., 1989; Eaton et al., 2011; Krueger & Markon, 2006a; Røysamb et al., 2011), the hypothesis of a more general psychopathology factor which may summarize individuals' propensity to develop any and all common forms of mental disorders has been advanced in recent years (Caspi et al., 2014; Lahey et al., 2012; Lahey et al., 2015). Caspi and colleagues (2014) coined the term *p factor* to represent this dimension of general psychopathology. Similarly to the general factor in intelligence (the *g factor*), which accounts for the positive correlation among all cognitive test scores (Spearman, 1904/1987), the *p factor* might summarize individuals' propensity to develop any and all forms of common psychopathologies.

A large amount of evidence has been gathered on the salience of the *p factor* as well as on correlates and risk factors associated with it – both of a genetic (e.g., Kendler, Myers, Maes, & Keyes, 2011; Pettersson, Larsson, & Lichtenstein., 2016) and environmental

type (Caspi & Moffit, 2018; Lahey et al., 2011).

The appeal of the *p factor* hypothesis lies in the fact that it provides, at least potentially, a thoughtful way to address the theoretical issue of the development of a general definition of psychopathology, framing both a global explanation of it and a comprehension of the plurality of its clinical manifestations. However, how its nature might be conceptualized remains a controversial topic (see: Caspi & Moffitt, 2018). For example, it is still unclear whether the *p factor* reflects a substantive construct or a mere statistical abstraction as well as whether it is the source or an effect of the psychopathological condition.

The current paper is aimed at contributing to this discussion. It outlines a new model of psychopathology intended to develop the substantive interpretation of the *p factor*. The model proposes a semiotic, embodied and psychoanalytic (Muller, 1996; Salvatore & Freda, 2011; Salvatore & Venuleo, 2008; 2009; 2017) conceptualization of psychopathology, in terms of the rigidity of the processes through which the person makes sense of experience.

The paper is broken up into five parts. Firstly (§2), an overview on the current debate on the *p factor* is briefly reported. Secondly (§3), a preliminary view of the *p factor* as a matter of rigidity is proposed. Thirdly (§4 and §5), the embodied, psycho-cultural-semiotic and psychoanalytic model of meaning-making is outlined, in order, finally, to frame the conceptualization of the *p factor* and more in general of psychopathology in terms of low dimensionality of the Phase Space of Meaning (§6).

2. The nature of the *p factor*

There is no consensus on what *p* means. The statistic models used to detect it highlight the sizable proportion of variance shared by large spectra of symptoms and disorders; yet they leave open the question about the source of such covariation (Bonifay, Lane & Reise, 2017; Revelle & Wilt, 2013; Van Bork, Epskamp, Rhemtulla, Borsboom, & van der Maas, 2017). Some authors have claimed that positive correlations among symptoms and disorders could just reflect, partly or wholly, systematic measurement biases. For example, it was suggested that the correlation could be due to the style of answering – e.g., to people's tendency to describe themselves in a positive or negative way (Pettersson et al., 2014). Widiger & Oltmanns (2017) suggested that the correlation amongst a battery of scales can reflect the level of impairment produced by the psychopathological condition. For instance, it has been shown that traits that are opposite to one another (e.g., lax/perfectionistic) can result in the same negative outcomes (e.g., poor work performance).

A similar view is proposed by authors adopting the network analysis frame (Cramer, Waldorp, van der Maas, & Borsboom., 2010; McNally, 2016), which shows that symptoms influence each other as part of a dynamic system. Following this view, it is not necessary to invoke a latent pathogenetic pathway toward psychopathology – the covariation among symptoms can be explained as the emergent effect of the interaction of the independent self-contained action of any single symptom (for a discussion of the network analysis approach to psychopathology, see: Forbes, Wright, Markon, & Krueger, 2017, for an innovative and intriguing application of this approach to the investigation of dissociative experiences in adults, see: Schimmenti & Sar, 2019).

Advocates of the *p* factor have objected to these alternative explanations of covariation, arguing that a large number of empirical findings show that the *p* factor predicts objective negative outcomes and consequently deserves to be considered as endowed with causative and therefore ontological status (e.g., Caspi & Moffitt, 2018). For instance, Lahey and colleagues (2012) showed that the general psychopathology factor was robustly associated with measures indicating difficulties in academic performance and in meeting the behavioral demands of the classroom; longitudinal findings in adults show the general factor predicts future mental health diagnoses robustly, when other factors are controlled.

While this kind of evidence justifies thinking of the *p* factor as something more than a mere statistical abstraction, it is less clear what it refers to. Indeed, when authors have tried to provide an interpretation of its clinical meaning, very different proposals as to the underlying mechanism were advanced. Several authors have suggested that *p* can be seen as a *super-ordered general factor of personality* (Irwing, 2013; Loehlin, 2012; van der Linden, Dunkel, & Petrides, 2016). This super-order factor is generally conceived as the tendency toward socially desirable behavior, which affects positively the ways a person is evaluated by others and the person's perceived social efficacy (Dunkel & van der Linden, 2014; Loehlin, 2012; for a review, see: Van der Linden, Dunkel, & Petrides 2016); other scholars suggested to relate the super-ordered factor to emotional intelligence (van der Linden et al., 2017), which is in turn is viewed as associated with the capacity to respond efficiently to social demands (Petrides, 2011; Zeidner, Roberts, & Matthews, 2008).

According to another view, *p* represents a *tendency to experience an unpleasant affective state*, often referred to as neuroticism or negative emotionality (Lahey et al., 2017). Different studies found that a factor of negative emotionality accounts for individual differences throughout cultures and clinical and non-clinical samples (John, Naumann, & Soto, 2008; Lahey, 2009; Tackett et al., 2013). Furthermore, negative emotionality was found to be associated either with internalization dimensions and externalization in adult samples (for a review, see: Krueger & Markon, 2006b) and to predict several different psychiatric disorders longitudinally (Kotov, Gamez, Schmidt, & Watson, 2010).

A further hypothesis is that at the basis of *p* (i.e., its functional mechanism) there is an *impulsive reactivity to emotion* (Carver, Johnson & Timpano, 2017). Negative emotionality therefore leads to a high *p* score, not alone, but only when it is associated with a weak capacity to inhibit behavioral or cognitive responses (e.g., rumination) to emotions (Caspi et al., 2014). Longitudinal studies highlight a relationship between low self-control in childhood, which is reflected in emotion dysregulation and a deficit in executive functions, and risk factors for pathology, included the *p* factor (Snyder, Miyake, & Hankin, 2015).

According to another view, the *p* factor is related to *deficits in the cognitive function*: higher levels of *p* were found associated to worse performance on a test requiring attention, concentration, mental control, velocity of visual-spatial processing and visual-motor coordination (Castellanos-Ryan et al., 2016).

Finally, it was suggested that the *p* factor – as a dimension of severity of psychopathology – has thought disorder symptoms (i.e. unwarranted irrational thoughts) at its pinnacle. This hypothesis is grounded on the evidence that these symptoms, and the processes

underlying them, occur alongside a range of other psychopathologies, rather than only in formal psychosis (Caspi et al., 2014; Murray & Jones, 2012).

These competitive explanations seem to share the same general approach – all attempts are based on the idea that the *p* factor reflects a given single (or restricted set of) latent construct(s) (e.g., super-ordered personality trait, unpleasant affective state, low impulse control), to be detected empirically, by means of the measurement of its level of association with the explanandum. However, in our view, this linear causal approach is critical since it fails to take into account that psychopathology is a complex process; as such, it needs to be understood by means of modelling the global dynamics underpinning its manifestations, rather than in terms of a collection of constructs correlated with it (for a critical discussion of linear causality in psychology, see: Heft, 2013; Lauro-Grotto, Salvatore, Gennaro, & Gelo, 2009; Salvatore, 2018). This helps to understand the plurality of competitive explanations of the *p* factor – indeed, insofar as the whole mechanism of psychopathology is not clarified, each explanation cannot but provide a way of representing only this or that facet of the global dynamics (one could add: under certain conditions of its functioning; see: Salvatore, 2018), just as each blind person represents the elephant in terms of the part of it experienced by touch.

In what follows an alternative approach is proposed. According to this approach, insofar as the *p* factor is a single, global component at the basis of psychopathology, to understand it a unified model of psychopathology is required, namely a model that conceives of psychopathology as resulting from a single global dynamics. To this end, the following sections outline a general model of psychopathology framing the explanation of the *p* factor as the marker of a global functional characteristic of the mind's way of working.

3. Psychopathology as rigidity of meaning-making

In the context of the current discussion, rigidity of meaning-making is intended as the way of making sense of experience characterized by low variability – “the tendency to develop and persevere in particular cognitive or behavioral patterns, and such patterns being continuously employed in situations where the pattern is no longer effective” (Morris & Mansell, 2018, p. 3). Accordingly, a rigid mode of meaning-making consists of the person's tendency to provide similar interpretative responses to different situations, events and states of self and of the world.

As a result of this tendency, the person expresses a low capacity to respond flexibly – therefore adaptively – to environmental demands: grounded on a largely invariant interpretative framework, they will be prone to address even quite different contexts in the same way, namely by responding to different relational and functional circumstances with stereotyped profiles of autonomic activations, frames (ways, modalities) of appraisal, forecasts, choices and actions. For instance, a person diagnosed as affected by paranoid personality disorder can be seen as an individual that is constrained to adopt a rigid interpretative schema whose application leads her/him to see other people as threatening, hostile enemies in almost all circumstances, regardless of the actual signals provided by the latter, and will make behavioral and interpersonal choices designed to deal with the perceived threat (e.g., hyper-vigilance, suspicious control of interpersonal proximity,

aggressive counterattack).

The idea that psychopathology is characterized by the fact that a certain pattern of mental functioning remains invariant despite the variation of the environmental conditions, and thus fails to attune to the demand of the social and interpersonal context, has solid roots in clinical theory and research. According to a more general theoretical standpoint, aimed at highlighting the need for a unified theory of psychopathology and (broadly speaking) normal cognitive processes, Bickard (1989) proposed to see mental disorders as the manifestations of an intrinsically rigid, auto-protective and unable-to-change cognitive system (see also: Christopher & Bickard, 1994). Ossorio (1985) stressed the idea that psychopathology implies some degree of “can’t” – namely some significant degree of restriction in ability – and not merely of “won’t” (refusal or unwillingness). Cierpka and colleagues (1998) emphasized that “there is a relation between the severity of psychopathology and the extent of stereotypical patterns in interpersonal relationships” (p. 242).

Research indicates that individuals are characterized by stable differences in their variability in psychological states, behavior and affects across time and situations (Pincus & Wright, 2010). These differences are even more general than the psychopathology/normality distinction; indeed, they are at the basis of the variable individual capacity of adjustment in social and organizational contexts (e.g., Girelli et al., 2018; Venuleo et al., 2018). A relationship between low psychosocial adjustment and low intra-individual variability in the ways of perceiving others and/or of relating to them has been posited by many personality and clinical psychological theories (see: Erickson, Newman & Pincus, 2009): standard cognitive behavioral therapy theory conceptualizes that *core beliefs* stereotypically shape perceptions of self, others and the world, conceived as forms of rigid, habitual, and non-conscious thinking about themselves, their experiences and their future, which affect a person's mood and actions (e.g., Beck, 1976). More recent versions of cognitive theories, so called *third wave* cognitive therapies, more focused on the inter-subjective genesis of psychopathological processes, postulate that maladaptive *interpersonal schemata* – stereotyped representations of self-other interactions and implicit expectations of how others will respond to one's fundamental wishes (e.g., autonomy, attachment) – regulate one's way of experiencing relationships (Dimaggio, Montano, Popolo & Salvatore, 2015; Young, Klosko & Weishaar, 2003). Group analysis theory postulates the concept of “saturated matrix” (e.g., Napolitani & Maggiolini, 1989; Nucara, Menarini, & Pontalti 1987, 1995; see also: Venuleo et al., 2018), conceived as rigid/saturated family systems of meanings which do not allow people to deal with new circumstances adaptively. Classical attachment theorists postulate that “internal working models of self” (e.g., Bowlby, 1988; Cassidy, 1990) – defined as a dynamic structure containing affectively charged cognitions about one's significant others, and operating largely automatically – guide people's perception and behavior in such a way as to confirm their self. More recent versions of attachment theory show how early experiences of dysfunctional, *insecure* attachment in early phases of growth cause a suboptimal organization of limbic and autonomic neural systems, and consequently generate an inflexible way of perceiving self and others and interpreting interpersonal transactions, and low ability to regulate emotions (Hill, 2015).

Recently, Morris and Mansell (2018) systematically reviewed the literature on trans-diagnostic processes,

defined as cognitive and behavioral processes that maintain psychopathology across disorders (Harvey, Watkins, Mansell, & Shafran, 2004; Nolen-Hoeksema & Watkins, 2011). They found increasing evidence that a number of trans-diagnostic processes (e.g., rumination, perfectionism, selective attention to internal or external stimuli, neuroticism, compulsivity) are associated with psychological distress only in certain contexts, and have advanced the hypothesis that there are individual differences in the rigidity/feasibility of using these processes to determine the degree of psychopathology. From a complementary viewpoint, in their important narrative review of the flexibility literature, Kashdan and Rottenberg (2010) suggested that the ability to adapt with flexible responses in order to meet situational demands and personal goals, could be the key contribution that flexibility makes to well-being.

In the final analysis, each of these models provides a way to understand rigidity, by making it the manifestation of the way an underpinning process operates. Yet these models do not provide an exhaustive, analytical description of rigidity. Therefore, the view of psychopathology as rigidity can be considered an intermediate conceptual step that also needs to be modelled. In other words, the inability of mental processes to change/modulate in accordance to environmental dynamism (i.e. rigidity) is not only the explanation of psychopathology (explanans), but also a way of depicting it that needs to be further explained (explanandum) (for a similar view, see: Morris & Mansell, 2018).

The following three sections outline a possible explanatory model of rigidity, based on an embodied, semiotic and psychoanalytic view of the mind (Kirshner, 2010; Muller, 1996; Salvatore, 2016, 2018). First, a general model of cognition is briefly envisaged (§ 4), complemented by a discussion on the role affects play in it (§5). Finally, the model is used to provide a particular outlook on rigidity, seen as the key characteristic of psychopathology (§ 6)

4. The harmonium model of cognition

4.1. Embodied cognition

Embodied Cognition (e.g., Barsalou, 1999; Borghi et al., 2017; Cuccio & Gallese, 2018) has provided convincing arguments and evidence in support of the view of the embodied roots of cognitive processes. According to this view, to a large extent the elaboration of sensorial input and of conceptual representations rely on the same neural circuit. This means that representations and meaning consist of the same neurobiological substance as perceptions (Barsalou, 1999). In the final analysis, conceptual knowledge is made up by sensorimotor patterns modelled through recursive interactions with the environment (for a discussion of the underpinning neurobiological mechanisms, see the discussion around the canonical neurons¹). These

¹ These neurons are activated when an individual carries out a goal-directed action with an object (e.g., grasps it). The same neurons are also activated when the same object is merely shown to him or her, without the action being actually undertaken (Gallese, 2000, 2001, 2003; Murata et al., 1997; Rizzolatti & Fadiga, 1998; Rizzolatti, Fogassi, & Gallese, 2002). In both cases, the characteristics of the object activate a plan of action for achieving a specific goal. This system, therefore, allows individuals to continuously simulate the actions required to effectively interact with objects in their world.

sensorimotor patterns comprise the body's propensity (with the brain being part of it, obviously) to interact in a certain way with objects and situations. As proposed by Verheggen and BaerVELdt (2007), the person does not *have* but *is* knowledge – knowledge is the person's dynamic form of being-in-the-world.

A major implication of this view is the recognition of the fact that cognitive processes (both perception and higher processes) are embedded within the interaction between the individual and the environment – in brief, cognition is at the service of action (Engel, Friston, & Kragic, 2015). This pragmatic view is quite different from the classical idea of cognition as a self-contained computation mechanism that elaborates the representation of the environment independently from the course of the action that uses it subsequently. By contrast, cognition works “on line” – the representations of the environment are dynamic sensorimotor patterns through which the person keeps his/her action coupled with the on-going variation of the environmental states, as happens in the moment-by-moment reciprocal attunement of two dancers. In brief, persons do not know in the abstract; they know what is relevant to coordinating their pragmatic relation with the world. The coordination of action is the regulative criterion and ultimate purpose of cognition.

4.2. Cognition is inferential, future-oriented, therefore self-referential

One corollary of the embodied pragmatic view of the mind which it is important to mention here is the inferential and future-oriented nature of cognition. This aspect can be understood if one takes into account that the environment is inherently dynamic, varying from moment to moment. Consequently, the coupling of the action with the world requires very fast continuous micro-variations of the body-in-action, enabling the individual to stay attuned with the environmental dynamics. This is the reason why the sensorimotor micro-regulation of the relation with the world can only be accomplished in terms of the inferential anticipation of the environmental state that is about to occur in the following moment – rather than in terms of the retroactive adjustment of the already performed action by reason of its output (Barsalou & Lawrence, 2011). From the current sensory input, the embodied cognitive system infers the sensorial pattern mapping the next moment's environmental state; and it completes this sensorimotor map with the simulation of the motor response that optimizes the fit of the action with that anticipated sensory pattern. In other words, the cognitive system continuously simulates: a) the pattern of sensations that the organism is about to feel in the next state of the world, and b) the motor response that best realizes the success of the simulation in a) (Barsalou, 2009). Once the next state of the world occurs, on the one hand the cognitive system detects the misfit of the inferential forecast, on the other hand it modulates the response aimed at recovering the fit; in parallel, it produces an additional inference that projects the inferential mechanism to the next moment.

The recognition of the inferential and future-oriented nature of cognition leads us to see its inherent self-referentiality. This term here means that the operative rule regulating cognitive processes is the search, conservation or restoring of the fit of the forecast with the following actual state of the world. This rule is indicative of self-referentiality because it implies that the cognitive system works in terms and with the aim

of the consistency (i.e., the fit) among its subsequent inner states (i.e., between the forecasting sensorimotor representation of the incoming environmental state and the subsequent forecasted sensorimotor pattern) (for a discussion of the referentiality of the cognitive process from a phenomenological standpoint, see: Varela, 1999).

It is worth highlighting that the recognition of the self-referentiality of cognition is not to deny that cognitive processes are able to gather information from the external world; yet it adds a further component of functioning, which leads us to see that the detection of the environmental states works in the dialectic interplay with the need of the cognitive system to keep its capacity of fit stable – i.e., its inner organization over time. As we will see below, the recognition of this dialectic interplay at the core of the cognitive system is relevant for understanding psychopathology – it enables mental disorders to be seen in terms of the lack of balance between the two components. However, before going into greater depth on this point, it is useful to discuss how the cognitive system strives to keep its capacity of fit. The next two sections aim to outline a model of this mechanism.

4.3. The dimensionality of cognition. The Phase Space of Meaning

At any moment, any environment field is made up of an infinite array of occurrences (e.g., to mention only the elementary physical components: colours, contours, temperature, pressure). Each of these occurrences has the potentiality to affect the state of the body and the action. The cognitive system has to reduce the infiniteness of the potential field of experience in order to extract meaningful patterns from it that are stable enough. Only if this happens is the cognitive system able to make inferences on the environmental field about to occur in the next moment.

The cognitive system reduces the inherent infinite uncertainty of the environmental field by organizing it, namely by setting up relations among some of the environmental occurrences that prove to be stable enough over time. As Gestalt theory taught, this process of organization occurs very early in the perceptual elaboration of the sensorial input (Witt, 2018); then it goes on at a higher level of cognitive elaboration, namely at the level of the interpretation of the perceptual pattern (on the view of meaning as definition of stable enough relations, see: Proulx & Inzlicht, 2012; for a more general discussion of the role played by interpretation in constituting experience, see: Fronterotta, Di Letizia, & Salvatore, 2018).

This process of organizing/setting up relations can be modelled by means of the analogy with Principal Component Analysis – the cognitive system aggregates clusters of co-occurring states that tend to co-vary over time; in so doing, it detects synthetic components, each of which is a category of meaning that maps one dimension of the whole environmental variability. For instance, the dimension that maps the movement of an object is constituted by the stable co-variation of the sensorial characteristics of the object with respect to the background – i.e. the colour and the contours of the objects tend to vary their relation with the background over time in almost the same way.

According to this view, cognitive processes can be modelled at computational level in terms of the mathematical concept of phase space – henceforth: *Phase Space of Meaning* (PSM, Salvatore, Cozzolino,

De Luca Picione, & Palmieri, submitted; Salvatore, Palmieri, Pergola, & Andrisano Ruggieri, 2019). Each PSM dimension corresponds to a dimension of the meaning that maps a component of the environmental variability.

A key point is that the complexity of the stimulation field goes far beyond the cognitive system capacity; therefore, the PSM that would be required to map the whole variability of the stimulation field would have infinite dimensionality. Accordingly, the cognitive system cannot but be engaged with a continuous operation of deep reduction of the potentially infinite dimensionality of the PSM: in so doing, most of the very many potential components of environmental variability are pushed into the background, and, consequently, only a few of them are foregrounded (Salvatore, 2016). In terms of the analogy with Principal Component Analysis, the cognitive system operates as the researcher that, in order to make the complexity of the dataset manageable, overlooks the supposedly marginal factorial dimensions extracted¹.

4.4. The modulation of dimensionality and the fit. The harmonium model

The PSM dimensionality is subjected to modulation, which means it varies both in terms of increasing and decreasing. The modulation of the PSM dimensionality is a key point because it provides a computational model of the inferential forecast (see: § 4.2). More particularly, our thesis is that the *modulation of the Phase Space of Meaning dimensionality is the mode through which the cognitive system searches/keeps the fit of the forecast*. This is because the modulation of the PSM dimensionality means a corresponding variation of the sources of variability that have to be taken into account by the inferential forecast: a decrease of the dimensionality of the PSM means that smaller proportions of environmental variability are mapped, therefore that the fit is sought in conditions of a lower level of uncertainty, and vice versa.

To use an image, take a gambler playing roulette, who has to choose between betting either on a number or on the red/black alternative (or another dichotomous combination available on the gambling table). In the first case, the forecast has to take 36 components of variability into account (i.e., occurrence vs no occurrence of each of the 37 roulette numbers minus 1), whereas in the second case just one (e.g., red vs black). Therefore, the former betting strategy implies a higher dimensional PSM, mapping a higher environmental uncertainty than the latter.

Three further remarks are worth making here.

First, as the last example implies, the modulation of the dimensionality is associated with two parameters that are inversely related. Any forecast can be qualified by a certain *information power*, namely the amount of cognitive control over the environment it produces – the more the uncertainty the forecast addresses, the more its success constitutes an information gain, and vice versa. From a specular standpoint, the forecast can be qualified by its *capacity of fit*, namely by the chance of being successful. Obviously, information power and capacity of fit are linked by an inverse relation

with each other – the prioritization of information power involves exposing the forecast to a higher risk of failure, therefore a decline in the capacity of fit; on the other hand, the prioritization of the capacity of fit implies the corresponding reduction of information power, namely the choice of a forecast that has a high chance of success, but that for this very reason has low informative power. In terms of the example provided above, the gambler betting on the number prioritizes information power (monetized as a high prize – 36 times the bet), accepting the high decline of the capacity of fit; the gambler betting on the red prioritizes the capacity of fit, paying for it with the corresponding reduction of informative power (this means a low prize – 1 time the bet).

This leads to the second remark. The modulation of the PSM dimensionality consists of the definition of a pay-off between informative power and capacity of fit – the more the dimensionality, the more the cognitive system prioritizes information power at the expense of the lower capacity of fit; vice versa, the lower the dimensionality, the more the capacity of fit is prioritized, at the expense of information power.

Third, the informative power/capacity of fit pay-off can be viewed as a function of the interplay of two facets – the *level of environmental uncertainty* and the *regulation of action*. On the one hand, the higher the environmental uncertainty, the more the cognitive system has to decrease the PSM dimensionality in order to preserve the capacity of fit. On the other hand, the search for capacity of fit is antagonized by the demand for information power coming from the regulation of the action – i.e., its purpose. The more the regulation of the action requires information power, the more the cognitive system is pushed to “sacrifice” the capacity of fit – that is, to increase the PSM dimensionality in order to fulfil the demand for information power. For instance, the aim of a person having dinner in a Michelin starred restaurant is to enjoy the nuances of taste, an aim that is not relevant when they eat their sandwich quickly during the short break at work. The regulation of the former action requires that a higher PSM dimensionality will enable the client of the starred restaurant to map the sensorial components comprising the nuances of taste (and those comprising the quality of the service as well); these components are not relevant for the regulation of the daily lunch action, which can therefore be based on a lower PSM dimensionality.

To conclude, the considerations made in this section provide a computational model of how the search for fit works – namely as an ongoing process of modulation of the PSM dimensionality. From a complementary standpoint, the modulation can be modeled as a function of the continuous balance in the pay-off between two antagonistic parameters: the demand for information power coming from the interaction with the environment and the cognitive system’s self-referential search for capacity of fit.

The label “harmonium” used to denote this view is meant to highlight the analogy with the musical instrument – like it, the mind continuously expands and contracts its inner space, in the moment by moment pursuit of a dynamic balance between the need to reproduce its inner organization and the representation of the environmental state.

5. Dimensionality and affects

This section completes the previous one. It aims to highlight the key role played by affect in

¹ It can be noted that the view of meaning and meaning-making in terms of dimensionality has solid roots in psychology (e.g., Kintsch, 1988; Landauer & Dumais, 1997) and close disciplines such as linguistics (Visetti & Cadiot, 2012).

psychopathology. To this end, first, a preliminary discussion about the view of affects as basic embodied meanings – based on the harmonium model outlined above – is provided. This discussion paves the way to the idea that affective meanings are core dimensions of the PSM, on which the modulation is exercised. Finally, the implications of this idea are explained.

5.1. *Affects as basic embodied meanings*

Affects can be viewed as embodied, primitive meanings (i.e., impossible to trace back to other forms of meaning), which provide a holistic interpretation of the experiential field as a whole, framing the cognitive elaboration of the sensorial input. This view has been developed by Semiotic Cultural Psychology Theory (Salvatore, 2013, 2016, 2018; Valsiner, 2007; 2014), which has adopted the psychoanalytic view of the unconscious as a particular mode of signifying experience (Fornari, 1979; Matte Blanco, 1975; Salvatore & Freda, 2011; Salvatore & Venuleo, 2008, 2009; Salvatore & Zittoun, 2011; Tonti & Salvatore, 2015).

Insofar as meaning is defined as the capacity of a certain state of mind to relate with/trigger certain other mental states (Peirce, 1897/1932; Proulx & Inzlicht, 2012; Salvatore, 2016), affects are meanings because they are able to trigger further mental states. Several studies have provided evidence of this capacity of affects. Turvey and Fertig (1970) (see also: Turvey, Fertig, & Kravetz, 1969) showed that the priming effect proved to operate also when prime and target stimuli shared the same affective connotation but had no semantic linkage. In a classic study (Murphy & Zajonc, 1993) participants evaluated abstract signs, void of semantic content, according to their affective valence (positive vs negative). This evidence legitimates the view of affects as a particular form of categorization which establishes relations between mental states that are independent of semantic criteria, instead being based on the similarity of the affective valence of the mental states involved.

Again, it can be noticed that a similar view of affects as meaning is at the basis of the very broad literature on the Semantic Differential. Hundreds of studies carried out over several decades (Osgood, May, Miron, & Miron, 1975) converge in proving that people use the bi-polar scales of the Semantic Differential according to three underpinning dimensions of meaning – evaluation, power and activity. Evaluation refers to the capacity to elicit positive or negative states in the person; power refers to the capacity to have or not to have an impact on the person; activity is the capacity to be the source or the target of the person's action. These three dimensions have been found to be active almost always, regardless of the objects investigated, the cultural context of the investigation, and the specific semantic content of the scales adopted as well. Accordingly, they have been interpreted as primitive affective meanings that provide the basic emotional connotation of experience (Salvatore & Freda, 2011; for a review of studies supporting the primitiveness of affects, see: Barrett, 2006; see also: Posner, Russell, & Peterson, 2005 for neuroscientific evidence).

A correlated characteristic of affective meanings that is worth highlighting here is their a-semantic nature (Ciavolino et al., 2017; Salvatore, Mannarini et al., 2019) – affective meaning establishes a relation between objects and properties regardless of their semantic content, by reason of the fact that they are associated

with the same embodied state. This characteristic is at the core of the psychoanalytic notion of primary process (Matte Blanco, 1975; Salvatore & Zittoun, 2011), and it has been highlighted by several lines of empirical research (Niedenthal, Halberstadt, & Innes-Ker, 1999; Salvatore et al., 2018; Tonti & Salvatore, 2015; Venuleo, Mossi, & Marinaci, 2017; Venuleo, Rollo, Marinaci, & Calogiuri, 2016; Venuleo, Salvatore, & Mossi, 2015; see also: Ciavolino et al., 2017).

The a-semantic nature of affective meaning has two major implications. First, affective meaning is holistic, namely it refers to the global field of experience taken as a whole. Needless to say, discrete objects (e.g., a person as well as a book, a face, a photo) also have an affective connotation; yet they are seen as part and parcel of the whole field of experience; in other words, the affective meaning shapes the whole field of experience and in so doing it frames the interpretation of the content of the experience (Salvatore & Freda, 2011). Second, as a result, the affective meaning has a homogenizing effect – all objects that are part of the same field of experience tend to be likened to the affective meaning associated with that field, regardless of the semantic differences among them – the affective class of meaning is like the dark night where all cows are black – or the sunny day where all cows are white. The more intense the affective activation, the more evident the homogenizing effect – a person in love feels they are walking on clouds, namely, they feel everything around them is good and positive; conversely, a person that is very upset will tend to see everything around them as targets and/or triggers for their anger.

5.2. *Affective meanings are the basic dimensions of the Phase Space of Meaning*

Once modelled as primitive meanings, affects can be considered the basic dimensions of the PSM. According to this view, the basic embodied affective meanings work as a major dimension of potential environmental variability that the cognitive system uses to carry out the inferential forecast. To use the terms of the affective dimensions identified by the literature on the Semantic Differential, the cognitive system focuses its inferential forecast on the variable capacity of the environmental field to be good/bad (evaluation dimension), to be able or unable to have an impact (power dimension) and to produce or receive action (activity dimension). Taken together, these three dimensions draw a 3-D PSM, each point of which consists of an environmental state experienced in terms of the values of the point's coordinates on the three dimensions – e.g., the experience of a situation as a threat corresponds to a point of the PSM with the following coordinates: high *bad*-high *powerful*-high *active* – i.e. something that: a) has the power to generate negative states in the subject, and it is actively engaged in doing it.

It has to be recognized that modelling affective meanings as basic dimensions of the PSM is in its initial stage of development (Salvatore, 2016). Therefore, it can rely on only limited and mainly indirect evidence in support. The most striking source of evidence comes from Tonti and Salvatore (2015). They asked participants to evaluate a set of concrete objects (e.g., a pen, a ball) on two semantically independent dimensions – pleasantness and importance. The extent these two evaluations are associated with each other was assumed to be the marker of the influence of the affective meaning on the cognitive processes involved

in the evaluation task. This assumption is based on the idea that the association between these two dimensions corresponds to a reduction of the dimensionality of the PSM, namely to the fact that the second dimension is somehow “enslaved” by the first. Authors were able to show that the greater the reduction of dimensionality (i.e., the higher the within-individual correlation between the two dimensions), the higher several markers of affective activation proved to be (e.g., time of execution of the task, homogeneity of judgments concerning independent social objects). Further indirect evidence supporting the reading of affects in terms of PSM dimensionality comes from the analysis of the psychotherapy process (Gennaro, Salvatore, Rocco, & Auletta, 2017; Rocco, Gennaro, Salvatore, Stoycheva, & Bucci, 2017; Rocco et al., 2018; Salvatore, Gelo, Gennaro, Manzo, & Al Radaideh, 2010). These studies showed that the clinical efficacy of the therapy is linked to the dynamic complexity of the clinical exchange – an aspect that can be modelled in terms of PSM dimensionality (as demonstrated by Salvatore, Tebaldi, & Potì, 2006/2009).

5.3. Implications

The harmonium model provides a way to explain the mechanism underpinning the relation between uncertainty and affects¹ – why and how the increase in uncertainty makes affects more salient in cognitive processes. The important point to take into account here is that, as discussed above (see: § 5.2), affects are primitive meanings. This means that they operate as basic dimensions of the Mental Phase Space, namely those components that always remain active, even when the dimensionality of that space decreases. As a result, the more reduced the dimensionality, the greater the incidence of the affective components, that is the proportion of environmental variability mapped by the affective dimensions of the space compared to the other dimensions reflecting semantic meanings².

In the final analysis, the harmonium model states that the incidence of affects in meaning-making does not reflect the direct increase in affective arousal, but is the consequence of the fact that, in conditions of uncertainty, the cognitive system seeks a fit by backgrounding many of the components of meaning that ground the elaboration of more discriminative maps of environmental

¹ This relation has been recognized by several analyses from Western societies’ current socio-political scenario (e.g., Inglehart & Norris, 2017; Greenberg & Arndt, 2012; Proulx & Inzlicht, 2012; Salvatore, Mannarini et al., 2019), that have highlighted the linkage between the very high variability of the social environmental – conceived of in terms of radical uncertainty – induced by the social and economic dynamics associated with globalization (e.g., economic inequalities, financial crisis, migration crisis) and a plurality of phenomena that are all symptoms of the high momentum reached by affective meaning-making in social and political behavior (e.g., rise of far-right parties, ideological and religious radicalization, xenophobia, hate speech, distrust in democratic institutions).

² In this case too, the analogy with the Principal Component Analysis (PCA) helps – take that the first two factors extracted by the PCA explains 30% of the whole variance, whereas the first 10 factors explain 60% of the whole variance. Should the researcher select a factorial space made up by the first 10 factors, the incidence of the first two factors would be 50%; yet if the researcher decreases the dimensionality of the factorial space to just the first two dimensions, their incidence would raise to the 100%.

variability. As a result, affective meanings gain the spotlight, so to say. This backgrounding characterizes any cognitive system, but it happens to different extents and this is where the difference between a functional and dysfunctional cognitive system lies.

Three corollaries can be drawn from the previous discussion.

First, it has to be recognized that affective meaning-making is not the opposite of rational thinking. Rather, affective meaning-making is the grounds, the first basic component of forms of cognitive activity characterized by the salience of the search for informative power (Salvatore, 2019). The rational reasoning mapping the environmental affordance of action does not replace the affective meaning but emerges when further dimensions of semantic meaning are added to the PSM, to integrate its core affective dimensions.

Second, in conditions of high uncertainty, affective meaning works as the stabilizer of cognition. Indeed, the generalized and homogenizing valence of affective meaning allows the deep uncertainty to be reduced, enabling the mind to address it (Venuleo, Gelo, & Salvatore, 2020). Take the case of the friend/foe affective schema which splits the world into two homogeneous, generalized classes: us vs them. Insofar as the representation of reality is strongly enslaved to this schema – as happens in several domains of the current socio-political scenario (Salvatore et al., 2018) – the environmental variability is drastically reduced. The meaning-maker just has to distinguish between in-group and out-group to make sense of who she/he is, what is happening, why, where to go, what for, and with whom.

Third, the view of affects as basic dimensions of PSM provides a computational depiction of the homogenizing nature of affective meaning. Indeed, the smaller the PSM dimensionality, the fewer the criteria by which two elements can be differentiated. For instance, the friend/foe schema represents a 1-dimensional PSM that enables just one distinction – to be part of the class of foes or of the class of friends, while any further difference within the two classes fades.

6. The dimensional model of psychopathology

The harmonium model outlined in the previous two sections provides a framework to model the rigidity of meaning-making, intended as the key concept on which to ground the model of the *p* factor hypothesis. It holds that the rigidity of meaning-making, therefore psychopathology, can be modelled computationally as a *PSM that keeps its dimensionality unchanged, rather than modulating it in accordance to the evolution of the environmental state*. In so doing, the cognitive system proves to be unable to establish a balance between information power and capacity of fit, with the effect of sacrificing the regulation of the action – namely, the functional and subjective quality of the relation between self and the world – in order to defend the capacity of fit, namely the reproduction of the cognitive system’s inner organization.

Below, a reading of a specific psychological pattern is proposed, in order to illustrate how the Phase Space of Meaning model frames the clinical understanding of psychopathological conditions. Then, consistently with the positional function of the current paper, some core details and implications of this view are highlighted in order to outline the research program associated with the further steps of their theoretical and empirical analysis.

6.1. A clinical illustration. Perfectionism

A cognitive process working in conditions of invariant dimensionality utilizes the same, limited number of stereotyped dimensions in dealing with environmental variability; the result is a sort of sclerotized meaning-making. An example of a sclerotized form of meaning-making is shown by patients with maladaptive perfectionism, a trait reflecting the tendency to set high standards and strive to reach highly valued personal goals in a variety of fields; the fear of making mistakes; an enhanced focus on parents' criticism; doubts about one's own performance; and a preference for organization and order (Dimaggio, Buonocore, Bandiera, & Montano, 2018; Frost, Marten, Lahart, & Rosenblate, 1990). Individuals with perfectionistic dispositions interpret most situations as a source of negative social evaluation and criticism that may then trigger feelings of shame and humiliation (Huprich, Porcerelli, Keaschuk, Binienda, & Engle, 2008), which in turn can be interpreted as confirming their poor personal value. In the perspective of this paper, individuals with maladaptive perfectionism approach the plurality of interpersonal domains by resorting to a severely limited dimensionality, which seems sclerotized on the construct of performative effectiveness. This reflects the salience of the affective framework of being subjected to the evaluation of a severe powerful other. Their cognitive system is unable to expand its dimensionality, including dimensions capable of grasping a different context of interpersonal meaning. When the environment asks the system to attune to that context, the latter will only be able to activate its stereotyped dimension in response. Let us imagine a perfectionistic cognitive system facing a contingent interpersonal environment calling for intimate involvement or cooperative attunement, such as the partner's request for emotional proximity. The system could read the environment as a severe criticism of one's ineffectiveness in "providing" emotional proximity, triggering a sense of shame. The following clinical excerpt exemplifies a perfectionistic cognitive system responding with a limited dimensionality when facing an interpersonal environment, the therapist, asking for intersubjective proximity in the form of a share of emotional suffering. The example will be useful also to suggest how therapy can promote an expansion of the system's dimensionality, an aspect that will be examined in greater depth later in this paper (see: § 6.3).

Judy was a 23-year-old patient, meeting DSM V criteria for obsessive compulsive personality disorder, who followed in individual psychotherapy with one of the authors. She had always been very scrupulous about studying, and asked for therapy because, just a few exams away from graduation, she felt no longer able to open a book. She told the therapist that her grandfather – to whom she was very close – had died a few months before, but that her suffering for this loss was "under control" and she did not think it had anything to do with her difficulty. The therapist noted that, in entering relationship with him, she appeared exaggeratedly formal, polite, poised, making an accurate choice of her words. This characteristic matched Judy's difficulty, deducible from her narratives, in experiencing a deep sense of belonging with her peers and of intimacy with her partner. In both cases she tended to think others would criticize her if she showed any weakness or her behavior was not ethically and morally irreproachable. Moreover, when the therapist tried to elicit a specific narrative context

in order to explore her vivid emotions, she maintained a sort of detached and severe attitude. For example, when the therapist asked to remember a recent moment in which she might have missed her grandfather, she kept a rigid, severe facial expression, and told the therapist that she did not want to give the impression that she "was looking for the excuse of her grandfather's death to avoid her duties". Monitoring his own feeling and thoughts, the therapist understood he was experiencing a sense of awkwardness and irritation towards the patient. After regulating these aversive feelings, he understood that they resulted from an unpleasant sense of being kept at distance by Judy's emotional coldness, and by the implicit impression that the patient was being exaggeratedly careful to make a good impression on him. On this basis the therapist hypothesized that his own internal experiences could be related to Judy's extreme difficulty in contacting and sharing her emotional suffering and need for understanding, and to her fear of being judged or criticized. Guided by these reflections, the therapist did not insist in the attempt to explore Judy's emotions, and moved the conversation onto Judy's field of study, anthropology, showing authentic curiosity. Gradually, Judy appeared more relaxed. At a certain point, while she was talking about the topic she had chosen for her degree thesis, the therapist noted an imperceptible change of facial expression, followed by the lowering of her gaze. The therapist gently helped Judy to focus her attention on those elements of her expression, and helped her to understand their cause: the image of her grandfather keeping her company while she studied had crossed her mind and she had felt very sad. Moreover, the therapist, in a most tactful manner, helped Judy to understand that she had had difficulty in getting in touch with her pain and sharing it with him because she was not used to giving space to her emotion and because of the unconscious expectation of being severely judged by the therapist. This was part of a more general psychological script that would be understood in the course of therapy, according to which the environment did not attune with her emotions, required from her an impeccable performance in all fields, and severely criticized her in case of suboptimal results.

Perfectionism has proven to be a core aspect of personality disorders (PDs) – mainly obsessive-compulsive, narcissistic and paranoid – and significantly correlates with overall PD severity (Dimaggio, MacBeth et al., 2018). It has also been shown to underlie many psychopathologies including eating disorders (Bardone-Cone, Wonderlich et al., 2007), mood disturbance (Hewitt, Flett, Sherry, & Caelian, 2006) and anxiety disorders (Frost & DiBartolo, 2002), making perfectionism a candidate as a trans-diagnostic mechanism underlying a broad array of psychiatric disorders (Egan, Wade & Shafran, 2011). This corroborates the central hypothesis of this paper, namely that at the basis of different syndromes lies a common dysfunction, that we conceptualize as an invariant dimensionality of PSM, and more specifically as a low dimensionality, incapable of expanding when faced with environmental variability.

6.2. The clinical meaning of dimensionality. Patients suffer from solutions

The dimensional model has several implications at the level of the clinical understanding of psychopathology. Two main aspects are outlined below. Further aspects are examined in more depth in the following paragraphs

First, the view of psychopathology as invariance

implies that there is not something like an optimal PSM dimensionality, which is applicable to each and every circumstance. Rather, the optimal PSM dimensionality varies, by reason of the local conditions of the relation between the person and her/his environment. The same dimensionality may prove to enable the cognitive system to regulate the action (and therefore allow the person to address the adjustment demand) in certain circumstances and domains of life, whereas it proves to be unable to do so in other situations. In the terms adopted above, the optimal PSM dimensionality is a function of the demand for information power raised by the regulation of the action. It therefore depends on the type of action and of the complexity of the environment where it is performed. Accordingly, the key point, from a clinical standpoint, is not to have a certain dimensionality, but to be able to vary it locally, in the contingency of the situation, to the required extent in order to address the requirement of the situated action.

The dependency of dimensionality on the context is relevant both within and between subjects. On the one hand, the individual crosses a plurality of domains of life (e.g., family, friends, job, leisure, citizenship) that have different degrees of social complexity; therefore, each of them calls for a different PSM dimensionality. The person is continuously called on to modulate her/his PSM dimensionality through the on-going movement from one domain to another. On the other hand, the complexity of the social environment is not homogeneous, but varies even dramatically, both in time and in space (Marinaci, Venuleo, Buhagiar, Mossi, & Sammut 2020; Venuleo & Marinaci, 2017). Living in a big city or in a little village, working alone for a stable set of clients that live in the same territory or having a position in a competitive international company that works on the global market, does not have the same complexity as the action-environment relation to be regulated.

Second, and this is a key aspect of the harmonium model, the view of the cognitive system as a self-referential process, involves considering *psychopathology as one of the mind's modes of working, rather than the manifestation of its disruption* (Salvatore, Venuleo et al., 2017). Indeed, as outlined above, the cognitive system does not stop working; rather, it cannot but reproduce itself somehow. What changes is the way this reproduction is carried out, varying according to how much it is able to provide the information power required for action. Psychopathology is therefore the cluster of modes of cognitive operation that, in order to keep the capacity of fit, give up the pursuit of information power. Paradoxically, one can say that psychopathology is a form of cognitive functioning even more efficient than the cognitive functioning underpinning mental health, in the sense that it is a mode of operation freed – to a considerable extent – from the demand for action regulation. Thus, one can conclude, paraphrasing Freud, that *patients suffer from solutions* – their modes of dealing with the issue of keeping the capacity of fit overshadows the demand for information power coming from engagement with the world. As a result, these modes generate existential and social costs (e.g., frustration, anxiety, adjustment failures, suffering lived and inflicted on others, social stigma and so forth).

6.3. The representation of clinical dynamics. Modification and transformation

It has to be noticed that viewing psychopathology

through the lens of the PSM enables a specific representation of the dynamics of meaning-making that underpins the clinical change.

The PSM leads us to recognize two levels of organization in the dynamics of the cognitive system's functioning. On the one hand, the representation of the environmental states evolves within the given PSM dimensionality. This happens every time one or more PSM dimensions map a variation of the environmental state. For instance, at a given moment of time the person experiences the loved partner as absent, not responding to his/her engagement – accordingly, the representation of the corresponding environmental state moves from present/good to absent/bad. This displacement happens within and on the grounds of the given PSM dimensionality – indeed, the PSM is precisely the way to map the components of environmental variability pre-reflexively assumed to be important. On the other hand, the evolution can concern the modulation of the PSM dimensionality – namely, the neutralization of one or more dimensions of the PSM or the emergence of new dimensions. For instance, imagine that at a certain point the person partially shelves the search for signals of the partner's presence and brings the latter's needs to the fore: this change could not be depicted as a displacement between two PSM points, but as the activation of a further PSM component of meaning – i.e. the component of taking care, which maps the other person in terms of having or not having needs to address. Accordingly, the modulation of the PSM dimensionality is a different kind of evolution, lying at a higher logical order – in this case the evolution of the cognitive system is not *within/in terms of* the PSM; rather, it is a change *of* the PSM.

As should be clear, the local/systemic articulation of the change reflects other well-established distinctions: e.g., assimilation/accommodation (Piaget, 1970); first/second order learning (Bateson, 1972); structure/organization (Maturana & Varela, 1980). Its utility lies in the fact that it frames a model of the clinical change, and of the associated clinical objectives, as well as a way of viewing the puzzling fact that psychopathology is at the same time stable and plastic, with patients that are constrained by it and at the same time vary in the clinical and non-clinical manifestations of their condition.

As to the model of change, it derives directly from the local/system distinction. A) Psychopathology can change in terms of *local* evolution: as a *modification*. In this case, the evolution is a matter of the emergence of a new attractor in the PSM. This happens when quite a constant train of environmental states activate a rather “unexplored” point of the PSM in a reasonably continuous way; in so doing, the new representation state gains momentum, as a function of the frequency of its use. Life is full of this kind of local evolutions that can have a major role in shaping people's feelings, beliefs, attitudes and relational network. To refer to the brief example above, as a result of the experience of quite redundant and consistent episodes of the partner's disengagement over an extended period of time, the state of the cognitive system may tend to shift more and more from, say, the point “good” to the point “bad” – namely, to make the latter point a new attractor. Similarly, a person with low self-esteem can learn a different image of themselves insofar as they have the chance to assimilate a reasonably redundant train of positive social feedback. This is consistent with the argument proposed here that spontaneous change, as well as the patient's symptomatic improvement – and symptomatic worsening – can be modelled as forms of local evolution.

Again, one can speculate that supportive interventions are aimed at providing, directly or indirectly, the trains of environmental states required to prompt the local evolution. B) The evolution can also be systemic: we propose to label this kind of change *transformation*, in order to distinguish it from the local evolution. In this case, the change consists of a considerable difference in the span of variation of PSM dimensionality (whether increasing or decreasing), which leads to a new landscape in interpreting the experience. One patient spent several months in therapy complaining about his inabilities and weakness that made him deserve the failures he experienced continuously; after that, he started, initially with surprise and concern, then with gratification, to register favourable social feedback, most of which associated with contingent positive change of his social world (e.g., his wife solved her job problem and became calmer and warmer with him; he took on a new, more important role at work; his second son emerged from quite a complicated transition from adolescence to adulthood). The somewhat lucky combination of positive environmental conditions (“lucky” in the sense that these conditions – and above all their temporal overlapping – depended mainly on environmental conditions beyond his control) made a new attractor emerge and the corresponding shift of the meaning-making trajectory in the PSM from “I am not worthy” to “I am worthy (somehow)”. The subsequent evolution, which took several years to accomplish, was the emergence of a different standpoint: the view of himself as the driver of the commitment to/desire of the significant other, and therefore the view of the other as someone/something to understand, to love, to take care of, to hold. Whereas the “I am not worthy”/“I am worthy” evolution was a *modification* occurring within and through the given PSM dimensionality, the view of himself as the driver of desire was a systemic evolution, a *transformation*: it involved the foregrounding of a component of meaning (active-passive) to which the patient was totally blind prior to the moment it emerged. Incidentally, it should be highlighted that once it emerged, this dimension worked in both the polarities, enabling the patient to comprehend circumstances concerning a plurality of domains (the relationship with his partner, with his children, on the job, with friends, even with hobbies and leisure) more deeply and flexibly, sometimes from the position of the driver (active) and sometimes from the position of the target (passive) of the desire.

In the final analysis, the modification/transformation is analogous to what happens when one is tuning in to the radio signal – one can search for the desired radio program by modifying the wave frequency, in so doing moving within the states mapped by the bandwidth. However, one may need to change the band – e.g., to move from a middle frequency to low frequency band, in this case introducing a transformation that projects into a new landscape.

6.4. Stability and variability of psychopathology

The clinical vignette presented in the previous section paves the way to addressing the puzzling issue of the interplay between stability and variability in the evolutionary trajectories of patients throughout their life events.

Here the main point is that psychopathology is not an invariant condition, both because it does not saturate all the hours of the patient’s day and domains of their life with the same constant intensity, and because it

evolves through the time span, in content as well as in intensity. The evolution of the patient described above occurred within the context of a psychotherapy; yet it could have occurred spontaneously too, probably, in that case providing an example of the variability of the clinical manifestations over a lifetime. On the other hand, a patient in the grip of a psychopathological condition does not get rid of it just by means of an act of will – both disease and illness are persistent, even when they can change in their intensity and content.

The local/systemic distinction outlined above provides a way of modeling this puzzling combination of variability and stability. One can speculate that what is stable in the condition of psychopathology is the tendency of the PSM to keep its dimensionality unchanged, regardless of the variation of the environmental states over space and time. At the same time, what varies is the local evolution of the cognitive system, namely the emergence of a new attractor within the given PSM, as a consequence of contingent patterns of life events. In brief, positive and negative life events introduce major changes in the environment the patient has to address; these changes can lead to a stable enough local evolution, i.e., to a modification of the landscape of the attractors characterizing the patient’s PSM. By contrast, systemic change of the latter, a transformation, in the terminology adopted in this paper, are instead a matter of clinical interventions aimed specifically at the structural development of the personality (Caspi & Roberts, 1990), or, one can conjecture, they are the consequence of traumatic life events (Jayawickreme & Blackie, 2014).

7. Conclusion

The *p* factor hypothesis – namely the idea that psychopathology can be modeled in terms of the salience of a single underpinning factor, transversal to the different mental disorders and comprising the clinical meaning of their manifestation – provides an innovation with breakthrough potential, in the perspective of a unified view of psychopathology. On the other hand, it needs to be studied in greater depth, in order to better understand its actual clinical meaning and implications.

This paper aspires to contribute to this perspective. It outlines a computational view of psychopathology as a single phenomenon – the *harmonium model* – aimed at providing ontological grounds for the *p* factor hypothesis.

First, the paper proposed to consider the *p* factor as the empirical marker of the degree of rigidity of the meaning-maker’s way of interpreting experience. According to this view, psychopathology consists of the meaning-maker’s tendency to identify him/herself with an invariant interpretative framework, regardless of the particular nature of situations, events, states of self and of the world. As a result of this tendency, the person is unable to respond to the environmental demands in a way that efficaciously takes the relevant specificity of the context into account and therefore, to build an adaptive response to it.

Second, the paper presented the Phase Space of Meaning as a computational model of the rigidity of meaning-making. The Phase Space of Meaning is framed in a more general model – the *harmonium model* – of how the mind works, which combines embodied cognition, semiotic cultural psychology, and psychoanalytic theory. From embodied cognition, it takes the idea that cognitive processes are, on the one hand, at

the service of the regulation of action and, on the other hand, that they work as a self-referential dynamics that has to reproduce their inner dynamic organization (the capacity of making inferential forecasts regulating the feed-forward process of tuning into the environment). From semiotic cultural psychology and psychoanalysis, it takes the view of cognitive processes as acts of meaning-making shaping the way the mind works as well as the idea of affects as generalized embodied meanings grounding the interpretation of experience. Moreover, at the core of the harmonium model lies the computational representation of meaning-making in terms of trajectories on the Phase Space of Meaning (PSM), each dimension of which corresponds to a component of the meaning that maps a component of environmental variability.

Framed within the harmonium model, the Phase Space of Meaning model maintains that psychopathology as rigidity, therefore the p factor, can be represented in terms of the invariance of the PSM dimensionality, which remains fixed instead of modulating by reason of the evolution of the environment and the related demand for regulation of the action. In this perspective, our model, attempting to provide ontological grounds to the p factor hypothesis, seems to offer some advantages compared to classical models of psychopathology cited above, which postulate that psychopathology is generated by a sort of rigidity of cognitive systems without explaining the intrinsic processes generating rigidity itself. Moreover our model seems also to offer a sort of explicative continuity with other recent perspectives on psychopathology, like the correlation network analysis: while this latter perspective shows elegantly how deterministic interactions may occur among symptoms leading to distinct psychopathological scenarios, our model can explain what happens upstream from the genesis of symptoms, namely in the interface between the cognitive system and the continuously changing environment. In simpler words, while network analysis explains how symptoms – in a certain way – get organized, our model can explain why symptoms are generated by an altered relationship between cognitive systems and environment.

Before concluding, it should be recognized that this paper has been written and is expected to be read as the manifesto of a research program. So far, most of the concepts the harmonium model is based on have weak empirical support, being sourced from theoretical elaborations and clinical experience. Moreover, several aspects of the model need to be clarified. Just to mention the main one: What role do ontogenesis, the cultural context and biography, respectively, play in defining the individual PSM, its dimensionality, its variability as well as the emergence of an attractor within it? How does the PSM dimensionality vary as a function of the dynamics of environmental states? What are the neurobiological correlates of the PSM and its dynamics? What are the dimensions of the PSM that are subjected to modulation and what are those that remain invariant? Are the variable dimensions the same, or do they vary in incidence and/or in content, within and between subjects? To what extent is it possible to change (increasing or decreasing) the variation of the dimensionality? How does the spectrum of mental disorders and associated clinical manifestations lend themselves to be represented in terms of PSM?

These questions envisage an ambitious research program, that we are keen to pursue in the near future.

References

- Achenbach, T. M., Conners, C. K., Quay, H. C., Verhulst, F. C., & Howell, C. T. (1989). Replication of empirically derived syndromes as a basis for taxonomy of child/adolescent psychopathology. *Journal of Abnormal Child Psychology*, *17*(3), 299–323. Doi: <https://doi.org/10.1007/BF00917401>
- Achenbach, T. M., & Rescorla, L. A. (2003). *Manual for the ASEBA school-age forms and profiles: For ages 18–59: Adult self-report and adult behavior checklist*. Burlington, VT: University of Vermont Research Center for Children, Youth, and Families.
- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (Fifth ed.). Arlington, VA: American Psychiatric Publishing.
- Ausubel, D. P. (1971). Personality disorder is disease. *American Psychologist*, *16*(2), 69–74. Doi: <https://doi.org/10.1037/h0042627>
- Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical psychology review*, *27*(3), 384–405. Doi: <https://doi.org/10.1016/j.cpr.2006.12.005>
- Barrett, L. F. (2006). Solving the emotion paradox: Categorization and the experience of emotion. *Personality and Social Psychology Review*, *10*(1), 20–46. Doi: https://doi.org/10.1207/s15327957pspr1001_2
- Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioural and Brain Science*, *22*, 577–609.
- Barsalou, L. W. (2009). Simulation, situated conceptualization, and prediction. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *364*(1521), 1281–1289. Doi: <https://doi.org/10.1098/rstb.2008.0319>
- Barsalou, L. W., & Lawrence W. (2011). Integrating Bayesian analysis and mechanistic theories in grounded cognition. *Behavioral and Brain Sciences*, *34*(4), 191–192. Doi: <https://doi.org/10.1017/S0140525X11000197>
- Bateson, G. (1972). The logical categories of learning and communication. In *Steps to an ecology of Mind*, (pp. 279–308). New York, NY: Ballantine Books.
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. New York, NY: International Universities Press.
- Bergner, R. (1997). What is psychopathology? And so what? *Clinical Psychology: Science and Practice*, *4* (3), 235–248. Doi: <https://doi.org/10.1111/j.1468-2850.1997.tb00112.x>
- Bickhard, M. H. (1989). The nature of psychopathology. In Lynn Simek-Downing (Ed.). *International psychotherapy: Theories, research, and cross-cultural implications*, (pp. 115–140). Westport, CT: Praeger Press.
- Billieux, J., Schimmenti, A., Khazaal, Y., Maurage, P., & Heeren, A. (2015). Are we overpathologizing everyday life? A tenable blueprint for behavioral addiction research. *Journal of behavioral addictions*, *4*(3), 119–123. Doi: <https://doi.org/10.1556/2006.4.2015.009>
- Bonifay, W., Lane, S. P., & Reise, S. P. (2017). Three concerns with applying a bifactor model as a structure of psychopathology. *Clinical Psychological Science*, *5*(1), 184–186. Doi: <https://doi.org/10.1177/2167702616657069>
- Borghi, A. M., Binkofski, F., Castelfranchi, C., Cimatti, F., Scorolli, C. & Tummolini, L. A. M. (2017). The Challenge of Abstract Concepts. *Psychological Bulletin*, *143*(3), 263–292.
- Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York, NY: Basic Books.
- Brenner, C. (1974). *An elementary textbook of psychoanalysis* (2nd ed.). New York, NY: International Universities Press.
- Carragher, N., Krueger, R. F., Eaton, N. R., Markon, K. E., Keyes, K. M., Blanco, C., . . . & Hasin, D. S. (2014). ADHD and the externalizing spectrum: direct comparison of categorical, continuous, and hybrid models of liability in a nationally

- representative sample. *Social psychiatry and psychiatric epidemiology*, 49(8), 1307-1317. Doi: <https://doi.org/10.1007/s00127-013-0770-3>
- Carver, C. S., Johnson, S. L., & Timpano, K. R. (2017). Toward a functional view of the p factor in psychopathology. *Clinical Psychological Science*, 5(5), 880-889. Doi: <https://doi.org/10.1177/2167702617710037>
- Caspi, A., Houts, R. M., Belsky, D. W., Goldman-Mellor, S. J., Harrington, H., Israel, S., . . . & Moffitt, T. E. (2014). The p factor: one general psychopathology factor in the structure of psychiatric disorders? *Clinical Psychological Science*, 2(2), 119-137. Doi: <https://doi.org/10.1177/2167702613497473>
- 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. Doi: <https://doi.org/10.1176/appi.ajp.2018.17121383>
- Caspi, A., & Roberts, B. W. (1990). Personality continuity and change across the life course. In A. P. Lawrence & P. J. Oliver (Eds.) *Handbook of personality: Theory and research, Second edition*, (pp. 300-326). New York/London: The Guilford Press.
- Cassidy, J. (1990). Theoretical and methodological considerations in the study of attachment and the self in young children. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), *Attachment in the preschool years: Theory, research and intervention* (pp. 87-119). Chicago: University of Chicago Press.
- Castellanos-Ryan, N., Brière, F. N., O'Leary-Barrett, M., Banaschewski, T., Bokde, A., Bromberg, U., . . . & Garavan, H. (2016). The structure of psychopathology in adolescence and its common personality and cognitive correlates. *Journal of abnormal psychology*, 125(8), 1039-1052. Doi: <https://doi.org/10.1037/abn0000193>
- Christopher, J. C., & Bickard, M. H. (1994). The persistence of basic mistakes: A re-examination of psychopathology within individual psychology. *Individual Psychology: Journal of Adlerian Theory, Research & Practice*, 50(2), 223-231.
- Ciavolino, E., Redd, R., Evrinomy, A., Falcone, M., Fini, V., Kadianaki, I., . . . & Rochira, A. (2017). Views of Context. An instrument for the analysis of the cultural milieu. A first validation study. *Electronic Journal of Applied Statistical Analysis*, 10(2), 599-628. Doi: <https://doi.org/10.1285/i20705948v10n2p599>
- Cicchetti, D. (1989). Developmental psychopathology: Some thoughts on its evolution. *Development and Psychopathology*, 1(1), 1-4. Doi: <https://doi.org/10.1285/i20705948v10n2p599>
- Cierpka, M., Strack, M., Benninghoven, D., Staats, H., Dahlbender, R., Pokorny, D., . . . & Körner, A. (1998). Stereotypical relationship patterns and psychopathology. *Psychotherapy and psychosomatics*, 67(4-5), 241-248. Doi: <https://doi.org/10.1159/000012286>
- Cohen, H. (1981). The evolution of the concept of disease. In A. L. Caplan, H. T. Engelhardt, Jr., & J. J. McCartney (Eds.), *Concepts of health and disease: Interdisciplinary perspectives* (pp. 209-220). Reading, MA: Addison-Wesley.
- Coleman, J. C. (1950). *Abnormal psychology and modern life*. Washington, DC: Scott Foresman and Company.
- 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. Doi: <https://doi.org/10.1017/S0140525X09991567>
- Cuccio, V., & Gallese, V. (2018, June 18). A Peircean account of concepts: grounding abstraction in phylogeny through a comparative neuroscientific perspective. *Philosophical Transactions of the Royal Society. Biological Sciences*, 373(1752). Doi: <http://dx.doi.org/10.1098/rstb.2017.0128>
- Dimaggio, G., Buonocore, L., Bandiera, A., & Montano, A. (2018). The problem of overcontrol: Perfectionism, emotional inhibition, and personality disorders. *Comprehensive psychiatry*, 83, 71-78. Doi: <https://doi.org/10.1016/j.comppsy.2018.03.005>
- Dimaggio, G., MacBeth, A., Popolo, R., Salvatore, G., Perrini, F., Raouna, A., . . . & Montano, A. (2018). The problem of overcontrol: Perfectionism, emotional inhibition, and personality disorders. *Comprehensive psychiatry*, 83, 71-78. Doi: <https://doi.org/10.1016/j.comppsy.2018.03.005>
- Dimaggio, G., Montano, A., Popolo, R., & Salvatore, G. (2015). *Metacognitive interpersonal therapy for personality disorders: A treatment manual*. London, UK: Routledge.
- Drysdale, A. T., Grosenick, L., Downar, J., Dunlop, K., Mansouri, F., Meng, Y., Fetcho, R. N., Zebley, B., Oathes, D. J., Etkin, A., Sudheimer, K., Keller, J., Mayberg, H. S., Gunning, F. M., Alexopoulos, G., Fox M., Pascual-Leone, A., Voss, H. U., Casey, B. J., Dubin, M. J., & Conor L. (2017). Resting-state connectivity biomarkers define neurophysiological subtypes of depression. *Nature medicine*, 23(1), 28-38. Doi: <https://doi.org/10.1038/nm.4246>
- Dunkel, C. S., & van der Linden, D. (2014). Evidence for the general factor of personality as social effectiveness. *Personality and Individual Differences*, 64, 147-151. Doi: <https://doi.org/10.1016/j.paid.2014.02.030>
- Eaton, N. R., Krueger, R. F., Keyes, K. M., Skodol, A. E., Markon, K. E., Grant, B. F., & Hasin, D. S. (2011). Borderline personality disorder co-morbidity: relationship to the internalizing-externalizing structure of common mental disorders. *Psychological medicine*, 41(5), 1041-1050. Doi: <https://doi.org/10.1017/S0033291710001662>
- Egan, S. J., Wade, T. D., & Shafran, R. (2011). Perfectionism as a transdiagnostic process: A clinical review. *Clinical psychology review*, 31(2), 203-212. Doi: <https://doi.org/10.1016/j.cpr.2010.04.009>
- Engel, A. K., Friston, K. J., & Kragic, D. (2015). Introduction: Where's the Action? In A. K. Engel, K. J. Friston, & D. Kragic (Eds.), *The Pragmatic Turn. Toward Action-Oriented Views in Cognitive Science* (pp. 1-15). Cambridge, UK: MIT.
- Erickson, T. M., Newman, M. G., & Pincus, A. L. (2009). Predicting unpredictability: Do measures of interpersonal rigidity/flexibility and distress predict intraindividual variability in social perceptions and behavior? *Journal of Personality and Social Psychology*, 97(5), 893-912. Doi: <https://doi.org/10.1037/a0016515>
- Forbes, M. K., Wright, A. G., Markon, K. E., & Krueger, R. F. (2017). Evidence that psychopathology symptom networks have limited replicability. *Journal of Abnormal Psychology*, 126(7), 969-988. Doi: <https://doi.org/10.1037/abn0000276>
- Forbush, K. T., & Watson, D. (2013). The structure of common and uncommon mental disorders. *Psychological Medicine*, 43(1), 97-108. Doi: <https://doi.org/10.1017/S0033291712001092>
- Fornari, F. (1979). *I fondamenti di una teoria psicoanalitica del linguaggio [Foundations for a psychoanalytic theory of language]*. Torino, Italy: Boringhieri.
- Foucault, M. (1965/1967). *Madness and Civilisation: A History of Insanity in the Age of Reason*, London, UK: Tavistock.
- Fronterotta, F., Di Letizia, R., & Salvatore, S. (2018). Processual Monism: A Fresh Look at the Mind-Body Problem. *Mind and Matter*, 16(2), 167-194.
- Frost, R. O., & DiBartolo, P. M. (2002). Perfectionism, anxiety, and obsessive-compulsive disorder. In G. L. Flett & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (p. 341-371). American Psychological Association. Doi: <https://doi.org/10.1037/10458-014>
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive therapy and research*, 14(5), 449-468. Doi: <https://doi.org/10.1007/BF01172967>
- Gallese, V. (2000). The inner sense of action: Agency and motor representations. *Journal of Consciousness studies*, 7(10), 23-40.
- Gallese, V. (2001). The "shared manifold" hypothesis: From mirror neurons to empathy. *Journal of Consciousness Studies*, 8(5-6), 33-50.
- Gallese, V. (2003). The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, 36(4), 171-180.

- Doi: <https://doi.org/10.1111/j.1468-2850.1997.tb00112.x>
- Gennaro, A., Salvatore, S., Rocco, D., & Auletta, A. (2017). Deconstructive and constructive dynamics in the clinical process: A step further in the validation of the two-stage semiotic model. *Journal of Constructivist Psychology, 30*(2), 105-126. Doi: <https://doi.org/10.1080/10720537.2016.1183536>
- Girelli, L., Alivernini, F., Lucidi, F., Cozzolino, M., Savarese, G., Sibilio, M., & Salvatore, S. (2018). Autonomy Supportive Contexts, Autonomous Motivation, and Self-Efficacy Predict Academic Adjustment of First-Year University Students. *Frontier in Education, 3*(95).
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. New York, NY: Simon & Shuster.
- Greenberg, J. & Arndt, J. (2012). Terror management theory. In P. A. M. Van Lange, A. W., Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 398–415). London, UK: Sage Publications Ltd, Vol. 2.
- Harvey, A. G., Watkins, E., Mansell, W., & Shafran, R. (2004). *Cognitive behavioural processes across psychological disorders: A transdiagnostic approach to research and treatment*. Oxford, England: Oxford University Press.
- Heft, H. (2013). Environment, cognition, and culture: Reconsidering the cognitive map. *Journal of Environmental Psychology, 33*, 14-25. Doi: <https://doi.org/10.1016/j.jenvp.2012.09.002>
- Hewitt, P. L., Flett, G. L., Sherry, S. B., & Caelian, C. (2006). Trait Perfectionism Dimensions and Suicidal Behavior. In T. E. Ellis (Ed.), *Cognition and suicide: Theory, research, and therapy* (p. 215–235). Washington, DC: American Psychological Association. Doi: <https://doi.org/10.1037/11377-010>
- Hill, D. (2015). *Affect Regulation Theory: A Clinical Model*. New York, NY: Norton.
- Huprich, S. K., Porcerelli, J., Keaschuk, R., Binienda, J., & Engle, B. (2008). Depressive personality disorder, dysthymia, and their relationship to perfectionism. *Depression and Anxiety, 25*(3), 207-217. Doi: <https://doi.org/10.1002/da.20290>
- Inglehart, R., & Norris, P. (2017). Trump and the populist authoritarian parties: the silent revolution in reverse. *Perspectives on Politics, 15*(2), 443-454. Doi: <https://doi.org/10.1017/S1537592717000111>
- Irwing, P. (2013). The general factor of personality: Substance or artefact? *Personality and Individual Differences, 55*(3), 234-242. Doi: <https://doi.org/10.1016/j.paid.2013.03.002>
- Jayawickreme, E., & Blackie, L. E. (2014). Post-traumatic growth as positive personality change: Evidence, controversies and future directions. *European Journal of Personality, 28*(4), 312-331. Doi: <https://doi.org/10.1002/per.1963>
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 114–158). New York, NY: Guilford.
- Kashdan, T. B., & Rottenberg, J. (2010). Psychological flexibility as a fundamental aspect of health. *Clinical Psychology Review, 30*(7), 865–878. Doi: <https://doi.org/10.1016/j.cpr.2010.03.001>
- Kendler, K. S., Myers, J. M., Maes, H. H., & Keyes, C. L. (2011). The relationship between the genetic and environmental influences on common internalizing psychiatric disorders and mental well-being. *Behavior genetics, 41*(5), 641-650. Doi: <https://doi.org/10.1007/s11699-011-9929-9>
- Kendler, K. S., Prescott, C. A., Myers, J., & Neale, M. C. (2003). The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Archives of general psychiatry, 60*(9), 929-937. Doi: <https://doi.org/10.1001/archpsyc.60.9.929>
- Kintsch, W. (1988). The use of knowledge in discourse processing: A construction-integration model. *Psychological Review, 95*, 163-182.
- Kirshner, L. A. (2010). Between Winnicott and Lacan: Reclaiming the subject of psychoanalysis. *American Imago, 67*(3), 331-351. Doi: <https://doi.org/10.1353/aim.2010.0014>
- Kotov, R., Chang, S. W., Fochtmann, L. J., Mojtabai, R., Carlson, G. A., Sedler, M. J., & Bromet, E. J. (2011). Schizophrenia in the internalizing-externalizing framework: A third dimension? *Schizophrenia Bulletin, 37*(6), 1168–1178. Doi: <https://doi.org/10.1093/schbul/sbq024>
- Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking “big” personality traits to anxiety, depressive, and substance use disorders: a meta-analysis. *Psychological bulletin, 136*(5), 768-821. Doi: <https://doi.org/10.1037/a0020327>
- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., Brown, T. A., Carpenter, W. T., Caspi, A., Clark, L. A., Eaton, N. R., Forbes, M. K., Forbush, K. T., Goldberg, D., Hasin, D., Hyman, S. E., Ivanova, M. Y., Lynam, D. R., Markon, K., . . . Zimmerman, M. (2017). The Hierarchical Taxonomy of Psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *Journal of Abnormal Psychology, 126*(4), 454–477. Doi: <https://doi.org/10.1037/abn0000258>
- Kotov, R., Ruggero, C. J., Krueger, R. F., Watson, D., Yuan, Q., & Zimmerman, M. (2011). New dimensions in the quantitative classification of mental illness. *Archives of General Psychiatry, 68*(10), 1003–1011. Doi: <https://doi.org/10.1001/archgenpsychiatry.2011.107>
- Krueger, R. F. (1999). The structure of common mental disorders. *Archives of general psychiatry, 56*(10), 921-926. Doi: <https://doi.org/10.1001/archpsyc.56.10.921>
- Krueger, R. F., Chentsova-Dutton, Y. E., Markon, K. E., Goldberg, D., & Ormel, J. (2003). A cross-cultural study of the structure of comorbidity among common psychopathological syndromes in the general health care setting. *Journal of abnormal psychology, 112*(3), 437-447. Doi: <https://doi.org/10.1037/0021-843X.112.3.437>
- Krueger, R. F., & Markon, K. E. (2006a). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology, 2*, 111–133. Doi: <https://doi.org/10.1146/annurev.clinpsy.2.022305.095213>
- Krueger, R. F., & Markon, K. E. (2006b). Understanding psychopathology: Melding behavior genetics, personality, and quantitative psychology to develop an empirically based model. *Current Directions in Psychological Science, 15*(3), 113-117. Doi: <https://doi.org/10.1111/j.0963-7214.2006.00418.x>
- Krueger, R. F., & Markon, K. E. (2011). A dimensional-spectrum model of psychopathology: Progress and opportunities. *Archives of General Psychiatry, 68*(1), 10-11. Doi: <https://doi.org/10.1001/archgenpsychiatry.2010.188>
- Krueger, R. F., Hopwood, C. J., Wright, A. G., & Markon, K. E. (2014). DSM-5 and the path toward empirically based and clinically useful conceptualization of personality and psychopathology. *Clinical Psychology: Science and Practice, 21*(3), 245-261. Doi: <https://doi.org/10.1037/a0028355>
- Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241-256. Doi: <https://doi.org/10.1037/a0015309>
- Lahey, B. B., Applegate, B., Hakes, J. K., Zald, D. H., Hariri, A. R., & Rathouz, P. J. (2012). Is there a general factor of prevalent psychopathology during adulthood? *Journal of Abnormal Psychology, 121*(4), 971–977. Doi: <https://doi.org/10.1037/a0028355>
- 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), 142-186. Doi: <https://doi.org/10.1111/jcpp.12300>
- 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. Doi: <https://doi.org/10.1111/jcpp.12300>
- Lahey, B. B., Rathouz, P. J., Van Hulle, C., Urbano, R. C., Krueger, R. F., Applegate, B., Garriock, H. A., Chapman,

- D. A., & Waldman, I. D. (2008). Testing structural models of DSM-IV symptoms of common forms of child and adolescent psychopathology. *Journal of Abnormal Child Psychology*, 36(2), 187-206. Doi: <https://doi.org/10.1007/s10802-007-9169-5>
- Lahey, B. B., VanHulle, A., Singh, A. L., Waldman, I. D., & Rathouz, P. J. (2011). Higher-order genetic and environmental structure of prevalent forms of child and adolescent psychopathology. *Archives of general psychiatry*, 68(2), 181-189. Doi: <https://doi.org/10.1001/archgenpsychiatry.2010.192>
- Landauer, T. K., & Dumais, S. T. (1997). A solution to Plato's problem: The latent semantic analysis theory of acquisition, induction, and representation of knowledge. *Psychological review*, 104(2), 211-240. Doi: <https://doi.org/10.1037/0033-295X.104.2.211>
- Lauro-Grotto, R., Salvatore, S., Gennaro, A., & Gelo, O. (2009). The unbearable dynamicity of psychological processes: Highlights of the psychodynamic theories. In J. Valsiner, Molenaar, P. C., Lyra, M. C., & N. Chaudhary (Eds.) *Dynamic process methodology in the social and developmental sciences* (pp. 1-30). New York, NY: Springer.
- Lenzenweger, M. F., Clarkin, J. F., Yeomans, F. E., Kernberg, O. F., & Levy, K. N. (2008). Refining the borderline personality disorder phenotype through finite mixture modeling: Implications for classification. *Journal of Personality Disorders*, 22(4), 313-331. Doi: <https://doi.org/10.1521/pedi.2008.22.4.313>
- Levy, K. N. (2012). Subtypes, dimensions, levels, and mental states in narcissism and narcissistic personality disorder. *Journal of clinical psychology*, 68(8), 886-897. Doi: <https://doi.org/10.1002/jclp.21893>
- Lilienfeld, S. O., & Marino, L. (1995). Mental disorder as a Roschian concept: A critique of Wakefield's "harmful dysfunction" analysis. *Journal of Abnormal Psychology*, 104(3), 411-420. Doi: <https://doi.org/10.1037//0021-843x.104.3.411>
- Loehlin, J. C. (2012). How general across inventories is a general factor of personality? *Journal of Research in Personality*, 46(3), 258-263. Doi: <https://doi.org/10.1016/j.jrp.2012.02.003>
- Maddux, J. E., Gosselin, J. T., & Winstead, B. A. (2012). Conceptions of psychopathology: A social constructionist perspective. In J. E. Maddux & B. A. Winstead (Eds.), *Psychopathology: Foundations of a contemporary understanding* (3rd Ed.). New York, NY: Routledge.
- Mallorquí-Bagué, N., Tolosa-Sola, I., Fernández-Aranda, F., Granero, R., Fagundo, A. B., Lozano-Madrid, M., . . . & Sánchez-González, J. (2018). Cognitive deficits in executive functions and decision-making impairments cluster gambling disorder sub-types. *Journal of gambling studies*, 34(1), 209-223. Doi: <https://doi.org/10.1007/s10899-017-9724-0>
- Matte Blanco, I. (1975). *The unconscious as infinite sets. An Essays in Bi-Logic*. London, UK: Gerald Duckworth & Company Ltd.
- Marinaci, T., Venuleo, C., Buhagiar, L., Mossi, P., & Sammut, G. (2019). Considering the socio-cultural terrain of hazardous behaviours: A Cross-Cultural Study on problem gambling among Maltese and Italian people. *Community Psychology in Global Perspective*, 6(1), 129-148. Doi: <http://dx.doi.org/10.1285/i24212113v6i1p129>
- Maturana, H. R., & Varela, F. J. (1980). *Autopoiesis and cognition: The realization of the living*. Dordrecht, Holland: Reidel Publishing Company.
- McNally, R. J. (2016). Can network analysis transform psychopathology? *Behaviour Research and Therapy*, 86, 95-104. Doi: <https://doi.org/10.1016/j.brat.2016.06.006>
- Morris, L., & Mansell, W. (2018). A systematic review of the relationship between rigidity/flexibility and transdiagnostic cognitive and behavioral processes that maintain psychopathology. *Journal of Experimental Psychopathology*, 9(3), 1-40. Doi: <https://doi.org/10.1177/2043808718779431>
- Muller, J. P. (1996). *Beyond the psychoanalytic dyad: Developmental semiotics in Freud, Peirce and Lacan*. New York, NY: Routledge.
- Murata, A., Fadiga, L., Fogassi, L., Gallese, V., Raos, V., & Rizzolatti, G. (1997). Object representation in the ventral premotor cortex (area F5) of the monkey. *Journal of neurophysiology*, 78(4), 2226-2230. Doi: <https://doi.org/10.1152/jn.1997.78.4.2226>
- Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: affective priming with optimal and suboptimal stimulus exposures. *Journal of personality and social psychology*, 64(5), 723-739. Doi: <https://doi.org/10.1037/0022-3514.64.5.723>
- Murray, G. K., & Jones, P. B. (2012). Psychotic symptoms in young people without psychotic illness: mechanisms and meaning. *The British Journal of Psychiatry*, 201(1), 4-6. Doi: <https://doi.org/10.1192/bjp.bp.111.131111>
- Napolitani, D., & Maggiolini, A. (1989). Gruppalità interna (o Gruppo interno) [Internal groupality (or internal group)]. *Rivista Italiana di Gruppoanalisi*, 6(1-2), 96-101.
- Niedenthal, P. M., Halberstadt, J. B., & Innes-Ker, Å. H. (1999). Emotional response categorization. *Psychological review*, 106(2), 337-361. Doi: <https://doi.org/10.1152/jn.1997.78.4.2226>
- Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for developing transdiagnostic models of psychopathology explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, 6(6), 589-609. Doi: <https://doi.org/10.1177/1745691611419672>
- Nucara G., Menarini, R., & Pontalti C., (1987). La matrice neotenica nella gruppoanalisi [The neotenic matrix in groupanalysis]. *Archivio di Psicologia, Neurologia e Psichiatria*, 48(3), 313- 326.
- Nucara G., Menarini R., & Pontalti C., (1995). La famiglia e il gruppo: clinica gruppoanalitica e psicopatologia [The family and the group: psychopathology and clinical group analysis]. In F. Di Maria, & G. Lo Verso (Eds.), *La psicodinamica dei gruppi. Teorie e tecniche. [in the psychodynamics of groups. Theories and techniques]*, Milano, Italy: Raffaello Cortina.
- Osgood, C. E., May, W. H., Miron, M. S., & Miron, M. S. (1975). *Cross-cultural universals of affective meaning* (Vol. 1). Urbana: University of Illinois Press.
- Ossorio, P. (1985). Pathology. In K. Davis & T. Mitchell (Eds.). *Advances in Descriptive Psychology* (Vol. 4, pp. 151-202). Greenwich, CT: JAI Press.
- Papakostas, G. I., Fan, H., & Tedeschi, E. (2012). Severe and anxious depression: Combining definitions of clinical sub-types to identify patients differentially responsive to selective serotonin reuptake inhibitors. *European Neuropsychopharmacology*, 22(5), 347-355. Doi: <https://doi.org/10.1016/j.euroneuro.2011.09.009>
- Peirce, C. S. (1932). On Sign. In C. Hartshorne, & P. Weiss (Eds.), *Collected Papers of Charles Sanders Peirce (Volume II)*. Cambridge, MA: Harvard University Press [Original version: 1897].
- Petrides, K. V. (2011). Ability and trait emotional intelligence. In T. Chamorro-Premuzic, S. von Stumm, & A. Furnham (Eds.), *The Wiley-Blackwell handbooks of personality and individual differences. The Wiley-Blackwell handbook of individual differences* (pp. 656-678). New York, NY: Wiley-Blackwell.
- Pettersson, E., Larsson, H., & Lichtenstein, P. (2016). Common psychiatric disorders share the same genetic origin: a multivariate sibling study of the Swedish population. *Molecular psychiatry*, 21(5), 717-721. Doi: <https://doi.org/10.1038/mp.2015.116>
- Pettersson, E., Mendle, J., Turkheimer, E., Horn, E. E., Ford, D. C., Simms, L. J., & Clark, L. A. (2014). Do maladaptive behaviors exist at one or both ends of personality traits? *Psychological Assessment*, 26(2), 433-446. Doi: <https://doi.org/10.1037/a0035587>
- Piaget, J. (1970). Piaget's theory (G. Gellerier & J. Langer, Trans.). In P. H. Mussen (Ed.), *Carmichael's manual of child psychology*. Vol. 1 (3d ed.). New York: Wiley.

- Pincus, A. L., & Wright, A. G. C. (2010). Interpersonal diagnosis of psychopathology. In L. M. Horowitz & S. Strack (Eds.), *Handbook of interpersonal psychology* (pp. 359–381). New York, NY: Wiley.
- Posner, J., Russell, J. A., & Peterson, B. S. (2005). The circumplex model of affect: An integrative approach to affective neuroscience, cognitive development, and psychopathology. *Development and psychopathology*, *17*(3), 715–734.
- Proulx, T., & Inzlicht, M. (2012). The Five “A”s of Meaning Maintenance: Finding Meaning in the Theories of Sense-Making. *Psychological Inquiry*, *23*(4), 317–335. Doi: <https://doi.org/10.1080/1047840X.2012.702372>
- Read, J., & Harré, N. (2001). The role of biological and genetic causal beliefs in the stigmatisation of ‘mental patients’. *Journal of Mental Health*, *10*(2), 223–235. Doi: <https://doi.org/10.1080/096382301213129>
- Revelle, W., & Wilt, J. (2013). The general factor of personality: A general critique. *Journal of research in personality*, *47*(5), 493–504. Doi: <https://doi.org/10.1016/j.jrp.2013.04.012>
- Rizzolatti, G., & Fadiga, F. (1998). Grasping objects and grasping action meanings: The dual role of monkey rostroventral premotor cortex (area F5). In G. R. Bock & J. A. Goode (Eds.), *Sensory guidance of movement* (pp. 81–103). London, UK: John Wiley & Sons
- Rizzolatti, G., Fogassi, L., & Gallese, V. (2002). Motor and cognitive functions of the ventral premotor cortex. *Current opinion in neurobiology*, *12*(2), 149–154. Doi: [https://doi.org/10.1016/S0959-4388\(02\)00308-2](https://doi.org/10.1016/S0959-4388(02)00308-2)
- Rocco, D., Gennaro, A., Salvatore, S., Stoycheva, V., & Bucci, W. (2017). Clinical mutual attunement and the development of therapeutic process: a preliminary study. *Journal of Constructivist Psychology*, *30*(4), 371–387. Doi: <https://doi.org/10.1080/10720537.2016.1227950>
- Rocco, D., Pastore, M., Gennaro, A., Salvatore, S., Cozzolino, M., & Scorza, M. (2018). Beyond verbal behavior: An empirical analysis of speech rates in psychotherapy sessions. *Frontiers in Psychology*, *9*, 978 Doi: <https://doi.org/10.3389/fpsyg.2018.00978>. Retrieved 30th of June , 2020, from: <https://www.frontiersin.org/articles/10.3389/fpsyg.2018.00978/full>
- Rosenhan, D. L., & Seligman, M. E. P. (1995). *Abnormal psychology* (3d Ed.). New York, NY: Norton.
- Røysamb, E., Kendler, K. S., Tambs, K., Ørstavik, R. E., Neale, M. C., Aggen, S. H., . . . & Reichborn-Kjennerud, T. (2011). The joint structure of DSM-IV Axis I and Axis II disorders. *Journal of abnormal psychology*, *120*(1), 198–209. Doi: <https://doi.org/10.1037/a0021660>
- Salvatore, S. (2013). The reciprocal inherency of self and context. Outline for a semiotic model of constitution of experience. *Interações*, *24*(9), 20–50. Doi: <https://doi.org/10.25755/int.2840> . Retrieved 30th of June , 2020, from: <http://www.eses.pt/interaccoes>
- Salvatore S. (2016). *Psychology in black and white. The project of a theory-driven science*. Charlotte, NC: InfoAge Publishing.
- Salvatore, S. (2018). Cultural Psychology as the Science of Sensemaking: A Semiotic-cultural Framework for Psychology. In A. Rosa & J. Valsiner (Eds). *The Cambridge handbook of sociocultural psychology* (2nd ed., pp 35–48). Cambridge, UK: Cambridge University Press.
- Salvatore, S. (2019). Beyond the meaning given. The meaning as Explanandum. *Integrative Psychological and Behavioral Science*, *53*(4), 632–643. Doi: <https://doi.org/10.1007/s12124-019-9472-z>
- Salvatore, S., Cozzolino, M., De Luca Picione, R., Palmieri, A. (submitted). The constitution of experience. The psychological big-bang and the Affective Pertinentisation Model (APER).
- Salvatore, S., Fini, V., Mannarini, T., Veltri, G. A., Avdi, E., Battaglia, F., . . . & Valmorbida, A. (2018). Symbolic universes between present and future of Europe. First results of the map of European societies' cultural milieu. *PLoS ONE* *13*(1), 1–33. Doi: <https://doi.org/10.1371/journal.pone.0189885>
- Salvatore S., & Freda, M. F. (2011). Affect unconscious and sensemaking. A psychodynamic semiotic and dialogic model. *New Ideas in Psychology*, *29*(2), 119–135. Doi: <https://doi.org/10.1016/j.newideapsych.2010.06.001>
- Salvatore, S., Gelo, O., Gennaro, A., Manzo, S., & Al Radaideh, A. (2010). Looking at the psychotherapy process as an intersubjective dynamic of meaning-making: A case study with discourse flow analysis. *Journal of Constructivist Psychology*, *23*(3), 195–230. <https://doi.org/10.1080/10720531003765981>
- Salvatore, S., Mannarini, T., Avdi, E., Battaglia, F., Cremaschi, M., Fini, V., Forges Davanzati, G., Kadianaki, I., Krasteva, A., Kullasepp, K., Matsopoulos, A., Mølholm, M., Redd, R., Rochira, A., Russo, F., Santaripa, A., Sammut, G., Valmorbida, A., & Veltri, G. A. (2019). Globalization, demand of sense and enemization of the other: A psychocultural analysis of European societies' sociopolitical crisis. *Culture and Psychology*, *25*(3), 345–374. Doi: <https://doi.org/10.1177/1354067X18779056>
- Salvatore, S., Palmieri, A., Pergola, F., & Andrisano Ruggieri, R. (2019). Trasformazioni sociali, affettivizzazione della sfera pubblica e ricerca di senso. [Social transformations, affectivization of the public sphere and search for sense] *Education Sciences & Society - Open Access Journal*, *10*(2). Retrieved 15th of March, 2020 from: http://ojs.francoangeli.it/_ojs/index.php/ess/article/view/8726
- Salvatore, S., Tebaldi, C., & Poti, S. (2006/2009). The discursive dynamic of sensemaking. In S. Salvatore, Valsiner, J., Strout, S. & Clegg J. (Eds.), *Yearbook of Idiographic Science – Vol. 1* (pp. 81–94). Rome, Italy: Firera.
- Salvatore, S., & Venuleo, C. (2008). Understanding the role of emotion in sense-making. A semiotic psychoanalytic oriented perspective. *Integrative Psychological and Behavioral Science*, *42*(1), 32–46. Doi: <https://doi.org/10.1007/s12124-007-9039-2>
- Salvatore, S., & Venuleo, C. (2009). The unconscious as symbol generator: A psychodynamic-semiotic approach to sensemaking. In B. Wagoner (Ed.), *Symbolic transformation* (pp. 79–94). London, UK: Routledge.
- Salvatore, S., & Venuleo, C. (2017). Liminal transitions in a semiotic key: The mutual in-feeding between present and past. *Theory & Psychology*, *27*(2), 215–230. Doi: <https://doi.org/10.1177/0959354317692889>
- Salvatore, S., Venuleo, C., Pace, V., Puglisi, M., Tandoi, M., Venezia, A., Grassi, R., & Mangeli, G. (2017). From psychopathology to service. A new view of the Clinical Psychology Intervention. In M. F. Freda, & R. De Luca Picione (Ed.), *Healthcare and Culture: Subjectivity in Medical Contexts* (pp. 175–197). Charlotte, NC: Information Age Publishing.
- Salvatore, S., & Zittoun, T. (Eds.). (2011). Outlines of a psychoanalytically informed cultural psychology. In S. Salvatore & T. Zittoun (Eds). *Cultural psychology and psychoanalysis in dialogue. Issues for constructive theoretical and methodological synergies* (pp. 3–46). Charlotte, NC: Information Age Publishing.
- Scheff, T. J. (Ed.). (1975). *Labeling madness*. Endlewood Cliffs, NJ: Prentice-Hall.
- Schimmenti, A., Caretti, V., & La Barbera, D. (2014). Internet Gaming Disorder or Internet Addiction? A plea for conceptual clarity. *Clinical Neuropsychiatry*, *11*(3–5), 145–146.
- Schimmenti, A. & Sar, V. (2019) A correlation network analysis of dissociative experiences. *Journal of Trauma & Dissociation*, *20*(4), 402–419, Doi: <https://doi.org/10.1080/15299732.2019.1572045>
- Sedgwick, P. (1982). *Psycho politics: Laing, Foucault, Goffman, Szasz, and the future of mass psychiatry*. New York, NY: Harper & Row.
- Slade, T., & Watson, D. (2006). The structure of common DSM–IV and ICD-10 mental disorders in the Australian general population. *Psychological Medicine*, *36*(11), 1593–1600.

- Doi: <https://doi.org/10.1017/S0033291706008452>
- Snyder, H. R., Gulley, L. D., Bijttebier, P., Hartman, C. A., Oldehinkel, A. J., Mezulis, A., . . . & Hankin, B. L. (2015). Adolescent emotionality and effortful control: Core latent constructs and links to psychopathology and functioning. *Journal of Personality and Social Psychology*, *109*(6), 1132-1149. Doi: <https://doi.org/10.1037/pspp0000047>
- Snyder, H. R., Miyake, A., & Hankin, B. L. (2015). Advancing understanding of executive function impairments and psychopathology: bridging the gap between clinical and cognitive approaches. *Frontiers in psychology*, *6*, 1-24. Doi: <https://doi.org/10.3389/fpsyg.2015.00328>
- Spearman, C. (1904/1987). The proof and measurement of association between two things. *The American Journal of Psychology*, *100*(3/4). Doi: <https://doi.org/10.2307/1412159>
- Stein, D. J., Phillips, K. A., Bolton, D., Fulford, K. W. M., Sadler, J. Z., & Kendler, K. S. (2010). What is a mental/psychiatric disorder? From DSM-IV to DSM-V. *Psychological medicine*, *40*(11), 1759-1765. Doi: <https://doi.org/10.1017/S0033291709992261>
- Szasz, T. S. (1974). *The myth of mental illness* (Rev. ed.). New York, NY: Perennial.
- Tackett, J. L., Lahey, B. B., Van Hulle, C., Waldman, I., Krueger, R. F., & Rathouz, P. J. (2013). Common genetic influences on negative emotionality and a general psychopathology factor in childhood and adolescence. *Journal of abnormal psychology*, *122*(4), 1142-1153. Doi: <https://doi.org/10.1037/a0034151>
- Tonti, M., & Salvatore, S. (2015). Homogenization of classification functions measurement (HOCFUN): a method for measuring the salience of emotional arousal in thinking. *The American journal of psychology*, *128*(4), 469-483. Doi: <https://doi.org/10.5406/amerjpsyc.128.4.0469>
- Turvey, M. T., & Fertig, J. (1970). Polarity on the semantic differential and release from proactive interference in short-term memory. *Journal of verbal learning and verbal Behavior*, *9*(4), 439-443. Doi: [https://doi.org/10.1016/S0022-5371\(70\)80085-8](https://doi.org/10.1016/S0022-5371(70)80085-8)
- Turvey, M. T., Fertig, J., & Kravetz, S. (1969). Connotative classification and proactive interference in short-term memory. *Psychonomic Science*, *16*(4), 223-224. Doi: <https://doi.org/10.3758/BF03336391>
- Valsiner, J. (2007). *Culture in minds and societies: Foundations of cultural psychology*. New Delhi, India: Sage Publications.
- Valsiner, J. (2014). *An invitation to cultural psychology*. Los Angeles, CA: Sage Publications.
- van Bork, R., Epskamp, S., Rhemtulla, M., Borsboom, D., & van der Maas, H. L. (2017). What is the p-factor of psychopathology? Some risks of general factor modeling. *Theory & Psychology*, *27*(6), 759-773. Doi: <https://doi.org/10.1177/0959354317737185>
- van der Linden, D., Dunkel, C. S., & Petrides, K. V. (2016). The General Factor of Personality (GFP) as social effectiveness: Review of the literature. *Personality and Individual Differences*, *101*, 98-105. Doi: <https://doi.org/10.1016/j.paid.2016.05.020>
- van der Linden, D., Pekaar, K. A., Bakker, A. B., Schermer, J. A., Vernon, P. A., Dunkel, C. S., & Petrides, K. V. (2017). Overlap between the general factor of personality and emotional intelligence: A meta-analysis. *Psychological Bulletin*, *143*(1), 36-52. Doi: <https://doi.org/10.1037/bul0000078>
- Varela, F. J. (1999). Present-time consciousness. *Journal of Consciousness Studies*, *6* (2-3), 111-140
- Venuleo, C., Gelo, O., & Salvatore, S. (2020). Fear, affective semiosis, and management of the pandemic crisis: COVID-19 as semiotic vaccine? *Clinical Neuropsychiatry. Journal of Treatment Evaluation*, *17*(2), 117-130. Doi: <https://doi.org/10.36131/CN20200218>
- Venuleo, C., Mangeli, G., Mossi, P., Amico, A.F., Cozzolino, M., Distanto, A., Ignone, G., Savarese, G., & Salvatore, S. (2018). The Cardiac Rehabilitation Psychodynamic Group Intervention (CR-PGI): An Explorative Study. *Frontiers in Psychology* *9*: 976. Doi: <https://doi.org/10.3389/fpsyg.2018.00976>
- Venuleo, C., & Marinaci, T. (2017). Disorder or socially adapted behavior? The field dependent nature of psychopathology and some implications for the intervention. In S. Gordon, J. Foster, S. Salvatore, & R. Andrisano Ruggieri (Eds). *Methods of psychological intervention. Yearbook of Idiographic Science*, vol. 7 (pp. 99-125) Charlotte, NC: Information Age Publication.
- Venuleo, C., Mossi, P., & Marinaci, T. (2017). Meaning and risk. The role of subjective cultures in the evaluation of hazardous behaviours. *Psicologia della salute*, *1*, 48-75. Doi: <https://doi.org/10.3280/PDS2017-001003>
- Venuleo, C., Rollo, S., Marinaci, T., & Calogiuri, S. (2016). Towards a cultural understanding of addictive behaviours. The image of the social environment among problem gamblers, drinkers, internet users and smokers. *Addiction Research & Theory*, *24*(4), 274-287. Doi: <https://doi.org/10.3109/16066359.2015.1126257>
- Venuleo, C., Salvatore, S., & Mossi, P. (2015). The role of cultural factors in differentiating pathological gamblers. *Journal of gambling studies*, *31*(4), 1353-1376. Doi: <https://doi.org/10.1007/s10899-014-9476-z>
- Verheggen, T., & Baerveldt, C. B. (2007). "We Don't Share!" Exploring the theoretical ground for social and cultural psychology: The social representation approach versus an enactivism framework. *Culture & Psychology*, *13*(1), 5-27.
- Visetti, Y. M., & Cadiot, P. (2002). Instability and theory of semantic forms. Starting from the case of prepositions. In S. Feigenbaum, & D. Kurzon (Eds.), *Prepositions in their Syntactic, Semantic and Pragmatic Context* (pp. 9-39). Amsterdam, Netherlands: John Benjamins
- Vollebergh, W. A., Iedema, J., Bijl, R. V., de Graaf, R., Smit, F., & Ormel, J. (2001). The structure and stability of common mental disorders: The NEMESIS study. *Archives of General Psychiatry*, *58*(6), 597-603. Doi: <https://doi.org/10.1001/archpsyc.58.6.597>
- Wakefield, J. C. (1992). Disorder as harmful dysfunction: a conceptual critique of DSM-III-R's definition of mental disorder. *Psychological review*, *99*(2), 232-247. Doi: <https://doi.org/10.1037/0033-295X.99.2.232>
- Watson, D. (2003). Subtypes, specifiers, epicycles, and eccentricities: Towards a more parsimonious taxonomy of psychopathology. *Clinical Psychology: Science and Practice*, *10*(2), 233-238. Doi: <https://doi.org/10.1093/clipsy.bpg013>
- Widiger, T. A., & Oltmanns, J. R. (2017). The general factor of psychopathology and personality. *Clinical psychological science: a journal of the Association for Psychological Science*, *5*(1), 182-183. Doi: <https://doi.org/10.1177/2167702616657042>
- Widiger, T. A., & Sankis, L. M. (2000). Adult psychopathology: Issues and controversies. *Annual Review of Psychology*, *51* (1), 377-404. Doi: <https://doi.org/10.1146/annurev.psych.51.1.377>
- Witt, J. K. (2018). Perception and action. In J. T. Wixted (Ed.), *Stevens' Handbook of Experimental Psychology and Cognitive Neuroscience* (Vol. 2). *Sensation, Perception, & Attention* (pp. 489-523). Hoboken (NJ), USA: Wiley & Son.
- Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York, NY: Guilford Press
- Zeidner, M., Roberts, R. D., & Matthews, G. (2008). The science of emotional intelligence: Current consensus and controversies. *European Psychologist*, *13*(1), 64-78. Doi: <https://doi.org/10.1027/1016-9040.13.1.64>