

Adaptive and Maladaptive Pathways of Self-Development: Mental Health and Interactions Among Personality Systems¹

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ABSTRACT

The developmental precursors of the “fully functioning person” (Rogers) have not received much systematic attention neither in psychological research nor in theories of personality and its development. Likewise, the developmental conditions for maladaptive personality functioning and the formation of psychological symptoms have not been the primary target of research in clinical psychology during the past decades (Castonguay, 2011). On the basis of a theory of personality that specifies a functional architecture of personality (i.e., personality systems interactions theory: PSI theory) developmental pathways are described that promote successful or impaired development of the integrated self which plays a pivotal role in PSI theory. Adaptive developmental pathways are described in terms of the developmental conditions promoting the ability to initiate unattractive instrumental activities (action control) and the integration of self-alien and painful experiences into an ever growing personal knowledge base (self-development). Maladaptive pathways are proposed to describe the developmental conditions for two major forms of psychological disorders: symptoms related to impaired action control (e.g., procrastination, eating disorders, depression) and symptoms related to impaired self-growth (e.g., rigidity, failure to learn from mistakes, psychosomatic symptoms).

Any theory of personality should be able to explain adaptive and maladaptive forms

of personality development. However, this issue does not belong to the prime targets of research efforts made in personality, developmental, or clinical psychology. Instead, competing hypotheses are derived from global constructs such as self-efficacy, irrational thinking, poor self-esteem and the like. Typical questions arising from this global-construct approach are: Does a man who has problems initiating simple activities at home (despite his efficient performance at his work) suffer from impaired self-efficacy, poor self-esteem, or does he simply have chauvinistic attitudes against his wife? Global constructs are also offered by the two major schools of thinking in psychology: From a psychoanalytic point of view, a woman’s overeating may be caused by an “oral regression” which dictates her behavior to eat as impulsively as oral needs drive baby’s feelings during the oral stage of development? In contrast, behavioristic learning theory would attribute those and other symptoms such as disturbed sleep, impaired immune function and stress-dependent pain like headache or backpain to the acquisition of irrational thinking or maladaptive behaviors that can be remedied by rewarding more appropriate behaviors.

Key words: affect regulation, depression, developmental psychopathology, eating disorders, mental health, personality functioning, procrastination, psychosomatic symptoms, self-development, self-regulation

INTRODUCTION

In the initial stages of scientific psychology, the search for the developmental origins of psychological health and illness had generated diverse explanatory approaches, notably those stemming from the two major schools of thinking, that is psychoanalysis and (cognitive) behaviorist approaches (Blatt, Auerbach, Levy, 1997; Castonguay, 2011; First, Tasman, 2004; Hollon, Beck, 2005). In this article I would like to explore the extent to which the state of the art accomplished in personality psychology can make a contribution to a better understanding of mental health and the advancement of adaptive and maladaptive personality development. I will start with a critical discussion of the limitations of current approaches to personality and explain a new theory of personality which suggests some new perspectives toward the mechanisms underlying self-development over a life span. I will apply this developmental model to explain the precursors of successful and impaired development of self-competencies and its role in the etiology of psychological disorders.

During the past 50 years or so, the contribution of personality psychology to a better understanding of mental illness has reached a stage of diminishing returns. Why does theory and research on personality have so little to say about the conditions for successful development or about the causes underlying psychological symptoms? One possible answer would be that the study of personality has focused on issues that do not have much relevance for some of the central questions related to healthy and disturbed personality functioning. In fact, for more than half a century a great portion of personality research has capitalized on a method that might not have much potential for answering questions about healthy or impaired personality functioning. The well-known story about Mullah Nasrudin can be taken as a warning against choosing an easy, but suboptimal method over a difficult, but adequate strategy to reach one's goal: When Nasrudin was looking for his lost key a man who had been helping him for a while in his

desperate search asked him: "Don't you remember where exactly you lost your key?" Nasrudin pointed down the street and said: "Down there, but I am searching here because I can see better under the street light."

Has personality psychology been searching for answers in the wrong place because it happened to get a hold of a convenient method that prompted it to search there? Interestingly, factor analysis has been used for more than five decades to answer a question that seemed optimally suited for it: What are the basic categories or dimensions people use to describe themselves or others? However, is this the essential question for a scientific study of personality? And if so, is factor analysis the appropriate method to answer it? A brief reflection about other sciences may provide a clue to answer this question: Would we have a periodic table in chemistry, the genetic code in biology and quantum mechanics in physics if those sciences would have used a method like factor analysis which aggregates things that happen to go together when we observe them in the external world? Probably not: Scientific progress has been made in the history of science when elements that naturally go together could be separated. Experimental dissociation rather than descriptive aggregation has been the pathway toward a deeper understanding of nature.

When I started my experimental studies into human motivation and personality some forty years ago I was surprised that the two fundamental questions that both common sense and psychological practitioners expected personality psychology to answer were not on the agenda of systematic experimental personality research. These two questions relate to volitional efficiency ("action control" or "self-management": Kanfer, 1970) and self-growth (Rogers, 1961). In order to answer these questions it takes more than collecting people's judgments about themselves and others and aggregating them according to their natural co-occurrence. An alternative approach to personality gained momentum in the seventies and eighties of the last century. This approach focused on mental contents in

order to improve our understanding of personality. The rationale behind this approach may be illustrated by the following example: If you want to predict the itinerary of a traveling salesman it seems better to find out something about his preferences, beliefs and goals (i.e., mental contents) than taking the engine of his car apart or analyzing the functional components of his brain. However, the problem with this content-focused method is that it often confounds prediction with explanation. Mental contents such as control beliefs (e.g., self-efficacy) or goals do very well in predicting behavior (Bandura, 1989; Locke, Latham, 1990). However, as a method for explaining the way personality works, the analysis of mental contents is about as useful as the prediction of a car's speed on the basis of the inclination of the gas pedal is in helping us understand how the many parts of a car work together.

The theory of Personality Systems Interactions (PSI theory) integrates diverse theories of personality and many findings from experimental psychology and neurobiology and adds an essential feature which runs counter to most traditional and current approaches to personality: Instead of focusing on mental contents such as beliefs, goals, intentions, as well as emotional contents, PSI theory provides a functional analysis of the mental systems and their interactions producing a given behavior. For example, when a student fails to do his homework, the common view would search for mental contents "explaining" this behavior by referring to his impaired control beliefs (low self-efficacy), insufficient goal-setting or his negative attitude and debilitating emotions (e.g., anxiety). The functional analysis provided by PSI theory adds an additional level of explanation to the content level: The homework-avoiding student may even have the right mental content (i.e., the intention to finish homework or a firm belief that he can do it), but for some reason the memory system which keeps reminding him of his uncompleted intention (i.e., intention memory) cannot make contact with the system which controls the necessary behavior. In the following section I will provide a brief summary of PSI the-

ory that will pave the way for the final section explaining the developmental conditions of psychological symptoms such as procrastination, messy behavior, eating disorders and stress-dependent psychosomatic symptoms on the basis of disturbed interactions among personality systems.

THE THEORY OF PERSONALITY SYSTEMS INTERACTIONS (PSI)

According to the *first modulation assumption* of PSI theory (Kuhl, 2000, 2001), the interaction between intention memory and the behavior control system can be intensified by positive affect (see the diagonal arrow "action control" in Figure 1). Therefore, the deeper reason why our student often fails to finish his homework may be found in his inability to generate positive affect which is necessary to enact his intention (i.e., the student may suffer from impaired "self-motivation"). As a result, development of action control, that is growing efficiency in enacting one's intentions requires some "emotional dialectic", that is an alternation between the ability to tolerate the loss of positive affect for a while (which helps to maintain even difficult or unpleasant intentions active in memory) and subsequent generation of positive affect (e.g., through self-motivation) to be able to enact the intention (Figure 1). Direct empirical evidence for this first modulation assumption of PSI theory stems from findings showing that volitional efficiency (i.e., action control) can be substantially increased when the shift toward positive affect is experimentally facilitated through external cues, for example, through positive affective primes presented before a difficult self-regulatory task such as the Stroop task (Kuhl, Kazén, 1999; Kazén, Kuhl, 2005) or through having participants shift their attention between the anticipation of positive affect associated with goal attainment and the tolerance of reduction of positive affect which is typically associated with the unpleasant sides of the immediate steps to be taken (Oettingen, Pak, Schnetter, 2001).

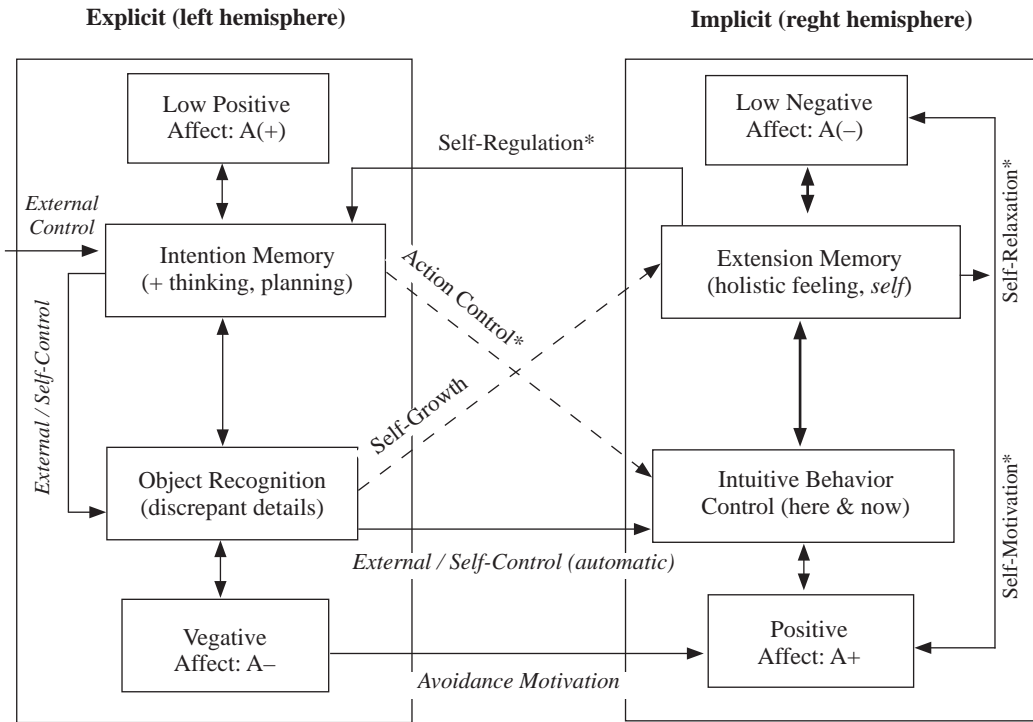


Figure 1. Cognitive systems of PSI Theory and their modulation by high (+) vs. low (-) positive (A+) or negative (A-) affect. Note: 1. Dashed arrows indicate antagonisms between cooperating systems that can only be overcome through an affective change from the affect associated with the starting system to the affect associated with the target system.

A second issue concerns the question why the performance of complex tasks deteriorates after people experience failure. Again, prevailing explanations have focused on mental contents. For example, performance deficits observed after exposure to uncontrollable failure (“learned helplessness”: Hiroto, Seligman, 1975) have been attributed to a generalized belief in loss of control or to low perceived self-efficacy (Abramson, Seligman, Teasdale, 1978; Bandura, 1989).

However, empirical findings are not compatible with this view. The data suggest a primary functional deficit which even occurs when impaired control beliefs do not generalize to new tasks (Kuhl, 1981; Lewinsohn et al., 1981). This functional deficit seems to re-

sult from an impairment of self-regulation in people who are not able to downregulate the negative affect elicited by a failure experience. According to the *second modulation assumption* of PSI theory, excessive negative affect inhibits access to an extended network integrating personally relevant experience (i.e., extension memory and the implicit self) and decouples this system from a low-level experiential system (i.e., object recognition) which focuses on a single detail (i.e., an “object”) rather than the extended overview provided by extension memory and the implicit self (Figure 1). Focusing on a single experience (i.e., an “object”) that cannot be integrated into the extended experiential network can be regarded as the basis of uncontrollable rumi-

nation: When people are stuck in a negative emotional state (i.e., when they are “state-oriented”), they cannot volitionally stop ruminating about negative events because their negative affect over-activates the object recognition system. Uncontrollable rumination about details that are isolated from the full picture (including one’s extended experiential knowledge base, that is the self or “extension memory”) impairs the ability to learn from mistakes, that is to update one’s experiential system (which would require some contact between the failure experience reverberating through the object recognition system and extension memory with its most important part: the implicit self).

Self-development (i.e., the development of a mature self) requires the ability to learn from mistakes and to integrate painful experiences into an ever growing self system. According to PSI theory, this process is driven by another form of emotional dialectics which operates along the negative axis: repeated shifts between a focus on some negative event or object (i.e., focusing on rather than repressing a mistake or a painful experience) and subsequent downregulation of negative affect to bring the negative event in contact with extension memory and help integrate the new experience into a growing intuitive knowledge base (see the diagonal arrow “self-growth” in Figure 1).

Empirical evidence directly supporting this second modulation assumption (i.e., facilitated self-access as a function of downregulation of negative affect) stems from experiments on self-infiltration (Baumann, Kuhl, 2003; Kuhl, Kazén, 1994): Under a condition arousing negative affect, participants who are not able to downregulate it (i.e., “state oriented” individuals) show an increased tendency to misattribute assigned tasks or options preferred by another person to their own choice (e.g., they remember activities as “self-chosen” even if those activities were suggested to them by an authority figure). Participants who are able to downregulate negative affect (i.e., action-oriented individuals) do not show this stress-dependent tendency toward false self-ascriptions of externally controlled activi-

ties. This finding is consistent with the second modulation assumption of PSI theory which states that excessive negative affect impairs self-access. Since the self can be understood as the integrated knowledge base derived from a huge variety of personal experiences, impaired self-access caused by exposure to aversive events can explain both deteriorated in performance of complex tasks (Hiroto, Seligman, 1975; Kuhl, 1981) and stress-dependent impaired discrimination between own and others’ choices (Kuhl, Kazén, 1994).

PSI theory not only describes the interactions among the four systems comprising the “architecture of personality” as a function of continuous shifts among opposing emotional states (i.e., between low and high positive affect for action control and between high and low negative affect for self-development: Figure 1). In addition, the theory provides detailed descriptions of the functional characteristics of each of the four cognitive-behavioral systems (i.e., intention and extension memory, object recognition and intuitive behavior control). The functional profiles of the four systems are based on experimental and neurobiological evidence related to explicit and implicit self-perception and explicit as well as implicit perception of the external world (Kuhl, 2001; Kuhl, Koole, 2008).

An especially noteworthy example of the functional analysis provided by PSI theory concerns the integrated (implicit) self which plays a pivotal role in this theory. Its functional profile is characterized by parallel-holistic rather than sequential-analytic processing up to the highest level of integration of personally relevant experience. The integrated self combines this parallel processing with an intuitive and multidimensional (“polysemantic”) representation of meaning (Baumann, Kuhl, 2002; Rotenberg, 2004) and a multidimensional integration of emotions and somatic markers (Bechara, Damasio, Damasio, 2000; Wittling, 1990).

Besides the structural elements of PSI theory (i.e., the four cognitive-behavioral systems plus reward and punishment systems modulating their interaction), additional features of the

theory relate to different forms of interactions among those systems. Two types of low-level control, two types of motivation, and two forms of high-level volition are of particular interest in the present context: The two types of low-level control are automatic and intuitive control. The common feature of automatic or intuitive control is that neither requires the participation of the two high-level systems (i.e., intention or extension memory). An important difference between automatic and intuitive control is that the former is more focused than the latter: A consciously perceived stimulus (processed in the object recognition system: Figure 1) can **automatically** elicit a behavioral routine associated with it. In contrast, **intuitive** behavior control is guided by an implicit perceptual network (Goodale, Milner, 1992) which provides parallel processing of a wide variety of context information rendering behavior control extremely flexible.

The second distinction concerning systems interactions relates to approach versus avoidance motivation. Automatic and intuitive control can operate without positive or negative affect (e.g., when I go to my office in the morning, irrespective of whether or not I happen to feel like it). However, affectively charged incentives add emotional support to approach or avoidance oriented forms of intuitive or automatic behavior, respectively. The two types of motivation mentioned earlier relate to this case: Avoidance motivation can operate at a low level of processing (e.g., energizing fight or flight routines) or at a high level (e.g., using experiential knowledge from extension memory for accomplishing self-relaxation); likewise approach motivation can operate at a low level (e.g., energizing consummatory behavior such as eating an apple or engaging in some habitual small talk) or at a high level of processing (e.g., when personal meaning and self-congruence are involved). High level avoidance motivation entails self-confrontational rather than defensive coping (e.g., focusing on a difficult experience and talking about it rather than denying or embellishing it). High level approach motivation enables the individual to engage in instrumental activ-

ities that do not have successive positive valence to energize behavior for their own sake (e.g., raising positive energy for an aversive task through self-motivation).

The third dichotomy concerning various forms of interactions among psychological systems involves volition: Self-control is a narrow form of control governed by intention memory and its narrow focus on one conscious intention at a time whereas self-regulation is a wide (parallel) and flexible form of largely unconscious regulation associated with the extended experiential network provided by the integrated self (Figure 1). The narrow vs. wide scope of processing associated with two modes of volition (i.e. self-control and self-regulation) mirrors the narrow vs. wide focus of attention which is characteristic for the two modes of low-level processing (i.e., automatic versus intuitive behavior control).

How can we learn more about the functional profiles of the four epistemic systems described in PSI theory? Neurobiological findings suggest a neuroanatomical basis of the functional profiles of the four personality systems. The relationship between functional and neuroanatomical distance is a useful heuristic in exploring possible implications of neurobiological findings for developing a functional architecture of personality: The lower the neuroanatomical distance between two networks (i.e., the more closely they are located in the brain) the more likely it is that they form a functional network of cooperating functional components, that is a "system" (Sporns et al., 2004). Ipsilaterality is a special case of this general rule: When two functions share the same hemisphere they are more likely to form an efficient functional unit compared to two functions that cannot cooperate unless a switch occurs from one hemisphere to the other (e.g., when a holistic experience supported by the right hemisphere is to be translated into propositional language generated in the left hemisphere). Does this neurobiological principle of the relationship between functional and neuroanatomical distance extend to personality dynamics? This seems to be the case: If the ipsilaterality hypothesis were cor-

rect, one should be able to increase self-access simply by activating any network within the right hemisphere. In fact, when the motor cortex of the right hemisphere is activated, the self-infiltration effect, produced by deficient self-access, disappears (Baumann, Kuhl, Kazén, 2005). Conversely, when the right hemispheric network supporting implicit self-perception is activated the right-hemispheric side of the motor cortex is activated (Molnar-Szakacs, Uddin, Iacoboni, 2005).

HEALTHY SELF-DEVELOPMENT

Since the general developmental implications of PSI theory have been elaborated elsewhere (Kuhl, Keller, 2008), I can focus here on some specific details related to the development of efficient action control and successful self-growth. How does healthy self-development come about? Presumably, interpersonal responsiveness is a crucial condition for a healthy development of the self system. The cognitive side of self-growth has been investigated in the context of children's acquisition of a theory of mind (Fonagy et al., 2002; Wimmer, Perner, 1983; Wellman, Cross, Watson, 2001) which seems to be closely related to the ability to take another person's perspective, a cognitive prerequisite for empathy (Decety, Jackson, 2006). Children's play has been recognized as an important basis for the acquisition of symbolic reasoning, which enables a child, for example, to take a perceived object (e.g., a pencil) as a symbol for something else (e.g., a person or a tree). Within the PSI framework, this symbolization corresponds to a transition from a dominance of object recognition (Figure 1) to the level of internal representations which eventually leads to the development of extension memory and the integrative self: When children learn to imagine mental states they are able to form mental representations of another person's mental state (e.g., thoughts, intentions, mood) even if those representations are different from observable objects in the external world or from their own subjective state. A failure at this developmen-

tal task can result in an impairment of social skills that heavily draw upon the ability to distinguish one's own or others' emotional states from the objective external world (e.g., when a borderline patient misattributes his own anger to an "aggressive gesture" of another person – who might actually behave in a very friendly manner).

According to the second modulation assumption of PSI theory, a high-level form of empathy with another person's emotional state (i.e., "accommodative empathy") develops through the emotional dialectics driving the continuous exchange between the integrated self and focusing on single "objects" that are unexpected, unwanted or otherwise not "fitting" within the integrated self (i.e., when a shift occurs between negative affect and its downregulation). During childhood this process requires consistent support from caretakers in helping the child tolerate and regulate negative emotional states (rather than defensively avoiding them). Accommodative empathy differs from a simpler form (i.e., "assimilative empathy") in which holistic representations of others' states can be easily understood (and felt empathically) provided they are already integrated within the self system (i.e., when they feel "familiar"). This simple form of empathy does not require emotional dialectics because it is confined to others' emotional states as long as they are similar to one's own state and can be easily assimilated. From the PSI perspective, assimilative empathy does not require a shift from object recognition (left hemisphere) to extension memory (right hemisphere). Instead, ipsilateral cooperation of intuitive behavior control and the integrated self are sufficient.

The more difficult form of (accommodative) empathy entails the ability to focus on painful discrepancies between one's own state and somebody else's current state. This ability to feel and understand another person's state even if it differs substantially from one's own current states or those experienced in the past can be developed through frequent shifts from holistic processing to object-focused processing and vice versa (Figure 1). This shift sup-

ports the development of “accommodative empathy”, that is the ability to understand and feel another person’s actual state, even if it substantially departs from one’s own or any personally familiar state. Accommodative empathy includes the ability to empathically feel another person’s state without confounding it with one’s own emotional state.

Ideally, the two forms of empathy cooperate. Assimilative empathy is activated through “emotional contagion” when another person’s state is or becomes similar to one’s own current state whereas accommodative empathy emerges when emotional similarity or contagion do not work because the discrepancy among one’s own and another person’s states cannot be overcome by similarity detection or emotional contagion. Self-growth is impeded by developmental conditions that interfere with the dialectical shift between those two forms of empathy, that is between holistic representations of familiar states (assimilative empathy) and focused recognition of self-discrepant states of others (accommodative empathy). On the other hand, healthy self-growth is promoted through autonomy support, that is when children or adults have the opportunity to interact with people who respond promptly and efficiently to their needs (Ryan et al., 2006). Repeated validation of one’s own feelings seems to be a prerequisite for learning to empathize both with familiar and with unfamiliar or even self-alien feelings of others without losing contact with one’s own internal states: When caretakers mirror a child’s emotional state (“you look so sad”) and simultaneously express their own emotions even if they differ from the child’s state, children learn to represent others’ emotional states separately from their own state even if the latter differ from the former. This ability should be a prerequisite for developing accommodative empathy.

Perhaps the most important step in healthy development of an integrated and autonomous self concerns the acquisition of affect-regulatory skills. Vygotsky (1978) described the development of self-regulation in terms of an internalization of external regulation received

from a caretaker. For example, the encouragement experienced from his father in difficult situations later enables a boy to generate encouragement himself in difficult situations (i.e., self-motivation). Within the PSI framework, this process is specified in more detail in the *systems conditioning model*: Self-regulation of affect (e.g., self-motivation or self-relaxation) requires a strengthening of the connectivity between the self (e.g., some network in the right prefrontal cortex) and an affect generating system (e.g., in the reward or punishment part of the limbic system, respectively). New connections are strengthened in the brain when the networks to be connected are activated almost simultaneously. Classical conditioning is the most familiar example for this process (Schmajuk, DiCarlo, 1992).

What does “quasi-simultaneous activation of the processes to be connected” mean for strengthening the connection between the self and affect generating systems? If quasi-simultaneous activation is crucial for strengthening the connectivity between those two systems, the affect generation system needs to be activated (e.g., when a caretaker encourages or soothes a child) in temporal contiguity with an activation of the self system. However, how can a caretaker tell when the child’s self would be activated? The answer is simple: A system is activated when it is needed. The self is needed for expression of one’s feelings (the right prefrontal cortex is indeed activated when babies express their distress at their mother leaving the room: Fox, Davidson, 1987). Later in life, the self is needed to feel understood (as a person) and to understand another person and empathize with him or her (Decety, Jackson, 2006). This is another way of saying that the self is activated through mutual understanding, that is within positive personal relationships. We can conclude, then, that external affect regulation is internalized when it is provided by a caretaker in conjunction with the child’s self being active, that is when the child feels understood and accepted within a personal relationship. The mere frequency of encouragement, of positive mood, or of soothing and relaxation does not suffice: It may change

affective sensitivity, but it would not change affect regulation because the latter requires a strengthening between the self and affectively sensitive systems which in turn requires external regulation of affect to occur in positive personal relationships (i.e., when the child's self is activated).

The explanatory power of PSI theory for understanding healthy development of self-related competencies can even be expanded beyond the level described until now: When the two macro-functions (i.e., action control and self-growth) are decomposed into their functional components explanatory power increases substantially. In the context of an extended research program focusing on the developmental precursors of action control and self-growth, our team at the Research Center for Aptitude Development at Osnabrück (Lower Saxony Institute for Early Childhood Education and Development: <http://nifbe.de/pages/das-institut/forschung/begabung.php>) has developed new methods for the assessment of developmental precursors of action control and self-development. Empirical findings are consistent with the central hypothesis that the quality of relationships between child and adult promote the development of self-competencies (e.g., intention memory, frustration tolerance, empathy, integration of negative experience, intrinsic motivation etc.) and that those competencies moderate the degree to which a child's abilities can be transformed into performance, which in turn promotes further development of latent abilities (Kuhl, Künne, Aufhammer, 2011; Völker, Schwer, 2011).

MALADAPTIVE PATHWAYS OF SELF-DEVELOPMENT

A pivotal developmental step concerns the coordination of explicit and implicit mental representations which probably involves the coordination between the two hemispheres. Implicit-explicit coordination (and its cross-hemispheric basis) should be involved when parents verbalize their children's mental states (e.g., "Oh, you look so happy right now"). The

explicit (denotative) part of this message is largely processed in the left hemisphere. Presumably, when the verbalization approximates the child's implicit subjective state (typically represented in the right hemisphere) rather well, explicit and implicit systems develop a smooth cooperative interaction in which the explicit system mirrors the implicit (experiential) one and the implicit system may learn to generate emotional support for whatever goals or intentions the explicit system comes up with (as long as those goals are or can be made self-compatible). However, when the caretaker's verbalizations do not match the child's implicit experience, coordination of explicit and implicit systems can be disrupted.

Examples of this case are parents' imposing their goals, aspirations or even their problems and conflicts on the child irrespective of his or her current mental state. In our (post-) modern world disruptions between left hemispheric verbal input and right hemispheric personal experience are strongly enforced by the information overload coming from the media, internet, and child-computer interactions. These effects can disrupt the mirroring of children's internal states even when parents are doing well in explicitly mirroring their children's implicit states (a computer game or TV does not reliably mirror the child's current emotional state in a self-compatible way). Even more serious dissociations between hemispheres can be caused by severe cases of traumatization (e.g., when an adult abusing a child describes his behavior as a sign of his love and affection for the child). Most of those parental failures to align their explicit feedback with the child's internal state can be related to what Rogers (1961) called "conditions of worth": To the extent that children's (implicit) experiential states are not reflected in explicit verbalizations they hear from their caretakers children implicitly learn that their experiential states are not respected as they are, but need to be changed or distorted in explicit communication in order to be accepted by the adult.

In the following paragraphs, I will apply this functional analysis provided by PSI theory to a deeper explanation of psycholog-

ical symptoms caused by disruptions among explicit and implicit systems. Presumably, patients who have been exposed to developmental conditions of invalid parental feedback develop symptoms such as procrastination and other impairments of action control (e.g., messy behavior), eating disorders, severe disruptions of social interaction, psychosomatic complaints associated with impaired stress regulation or even auto-aggressive behavior (Blasczyk-Schiep, 2004; Fonagy et al., 2002; Linehan, 1993; Sapolsky, 1992). Analyzing those symptoms within the functional architecture of personality provided by PSI theory (Ritz-Schulte, Schmidt, Kuhl, 2008), we can explain them on the basis of impairments of action control or self-development and the disruption of the two forms of affect regulation which modulate the interaction among the systems relevant for action control or self-development, respectively (see diagonal arrows in Figure 1).

SYMPTOMS RELATED TO REDUCED POSITIVE AFFECT AND IMPAIRED ACTION CONTROL

Let us begin with symptoms presumably associated with impaired action control. What do procrastination, messy behavior, and eating disorders have in common? From an action control point of view, these symptoms are associated with an impairment of the motivational basis for instrumental behavior, that is a general problem of action control which need not be confined to the specific symptoms at hand. Procrastinators, messies and many patients with eating disorders may have no problem engaging in any immediately gratifying behavior. Their problems arise when they want to engage in some unattractive instrumental behavior (not necessarily related to their specific symptoms) in order to reach a goal (e.g., studying a boring lecture to be well prepared for an exam). Kurt Lewin (1936) has already mentioned that it is difficult to explain, from an action theoretical point of view, why a person should engage in any instrumental beha-

vior that does not have a positive valence in and of its own. Where does the energy come from that would motivate the person to engage in unattractive behavior?

One possible pathway is designed for attempts to avoid an aversive state. This pathway starts with the negative affect associated with the to-be-avoided aversive state. Positive affect may be involved here as a secondary source of behavioral facilitation: a certain type of positive affect (e.g., relief), derives from avoiding an aversive state. In behavioral learning theory, this condition is called negative reinforcement. Presumably, external control is mediated by a similar form of avoidance motivation. The avoidance-based pathway from external control to behavior control is illustrated in Figure 1 as a possible continuation of the external control pathway indicated by labels in *italics* which starts with some sort of external control (e.g., mother telling the child to finish homework in a strict tone): From the PSI point of view, positive affect caused by the relief from negative affect, that is avoidance motivation (e.g., when the child, after starting with his homework, feels some relief from his anxiety to get punished) may intensify object-oriented automatic (intuitive) behavior because object recognition is enhanced by negative affect. Recall that object recognition amounts to focusing on single details abstracted from their context (e.g., focusing on a requested outcome without taking into account the motivational context comprising many positive and negative valences associated with the activity). As a result behavior becomes rigidly and narrowly focused on the requested outcome rather than the motivational context of the activity in question (Elliot, McGregor, 2001).

Self-control is functionally similar to external control. In contrast to automatic and intuitive behavior control, self-control involves an explicit intention which is normally formed when enactment is emotionally difficult (i.e., with an unattractive instrumental activity). According to PSI theory, self-control can be conceptualized as an internalized form of external control: In either case an intention is generated (either external or by an

internal “controller”) and enactment of that intention does not require coordination with (right hemispheric) high level self-regulatory processing such as self-motivation. As mentioned earlier, the latter mode of volition which is called “self-regulation” is not as narrowly focused on one behavioral intention as it is the case for self-control. Specifically, self-regulation involves the wide experiential network provided by extension memory and the integrated self (Figure 1). This explains the enormous flexibility associated with self-regulation and personal autonomy or self-determination (Ryan et al., 2006): When the intended action fails to reach the goal alternative new options for action can be retrieved from extension memory. Also, the extended connectivity between extension memory and emotions opens many possibilities for finding motivational support for an intended action (i.e., self-motivation). For example, when a boring math lesson from a textbook has to be memorized, the extended experiential network of the integrated self may remind of some positive sides of that lesson (e.g., things one can do with this knowledge) or of the positive implications of obtaining a good grade etc).

In contrast, self-control has limited access to positive incentives for action and it is narrowly focused on one specific action: In Figure 1 the final part of the self-control pathway is denoted by the horizontal arrow between object recognition (which can be intensified by negative affect if there is one) and intuitive behavior control. Both external control and self control can be described in PSI theory with or without avoidance motivation. Without avoidance motivation object recognition simply focuses on an outcome to be achieved or on an error to be corrected and automatically elicits appropriate behavioral routines to reach the desired outcome or to correct the error, respectively: In Figure 1 the external/self-control route from intention memory (indicated in italics) can reach the intuitive behavior control system either through the avoidance motivation pathway or through the direct pathway from object recognition into behavior control.

The latter “affect-free” route is based on the fact that PSI theory integrates neurobiological evidence suggesting a route into behavioral facilitation which does not necessarily depend on participation of reward or punishment systems (i.e., on approach or avoidance oriented incentives). This nigrostriatal dopaminergic system can support automatic (habitual) behavior without the mediation of reward or punishment related affect (Depue, Spont, 1986; Faure et al., 2005). For example, habitual tooth-brushing in the morning may be performed automatically, that is even when one does not enjoy it and even in the absence of any avoidance motivation (e.g., thinking of the negative consequences of a failure to do it). Empirical evidence for this automatic and potentially incentive-free form of behavioral facilitation has been collected by Gollwitzer (1999) and his associates.

Either self-control route into behavioral facilitation (i.e., the automatic and the avoidance-oriented one) can be a basis for highly committed work motivation, even up to the risk of workaholism and other forms of compulsive behavior (Wojdyło, 2010). People who have problems initiating instrumental behavior can sometimes perform instrumental activities through one of the two self-control forms of behavioral facilitation (i.e., when their behavior is energized through negative incentives, time pressure, external threats or through incentive-free automatized habitual behavior). Their problems arise in situations in which they cannot rely on negative incentives (e.g., external pressure or threat) or automatized behavior. In such cases, failure to enact instrumental behavior occurs when people who typically rely on external incentive or self-control are confronted with situations in which behavioral facilitation largely depends on positive incentives (e.g., at home, during leisure time, in friendly contexts etc.) or when the individual’s sensitivity to punishment or negative affect is rather low, dispositionally or temporarily.

It should be noted that instrumental activities are typically associated with low positive affect rather than with high negative

affect (i.e., they are not attractive, but they need not be threatening). In this case, upregulation of positive affect (i.e., self-motivation) is required as the natural form of behavioral facilitation. Self-motivation is not provided by self-control (which is associated with negative affect or affect-free automatic behavior). Instead, another form of volition is required, that is self-regulation in the sense described above: When intentions are to be enacted without automatic behavior control and without capitalizing on negative affect and avoidance motivation, the transition from intention memory to intuitive behavior control needs to be mediated by generating positive affect as a primary source of behavioral facilitation. Early behaviorists speculated that some sort of automatic anticipation of positive affect associated with imagined goal attainment would provide the necessary behavioral facilitation (cf. Atkinson, 1964). Do procrastinators, messies and under- or overeaters have problems imagining the positive sides of goal attainment (e.g., memorizing the boring lesson, cleaning up one's desk or keeping one's dietary intentions, respectively)? Even if this were the case, it would not suffice to explain their problems: Empirical studies revealed that, compared to negative imagery, positive goal imagery alone does not increase facilitation of instrumental behavior, that is behavior that requires the actor to complete some unpleasant or difficult steps (Oettingen, Pak, Schnetter, 2001). Oettingen's research demonstrates that positive anticipatory imagery needs to be coordinated (or "contrasted") with the difficult instrumental steps to be taken, in order to improve efficient action control (i.e., enactment of difficult intentions without relying on automatic behavior or avoidance motivation).

According to PSI theory, a difficult intention is formed when people can tolerate the inhibition of positive affect (i.e., frustration or delay of reward) for a while (see Figure 1: A(+) and intention memory). An emotionally difficult intention is enacted when the motivational energy for (unattractive) instrumental behavior can be generated. According to PSI theory, this positive energy is largely generated with-

in the self system through a process of self-motivation (Figure 1) whose developmental conditions have been described in the systems conditioning model mentioned above (this assumption has been confirmed in a recent study in which self-generated behavioral facilitation was associated with a brain network which is close to the one supporting implicit self-representations: Radke et al., 2008). From this point of view, the most obvious developmental condition causing problems with instrumental behavior should be a lack of responsive (self-contingent) encouragement during childhood: As mentioned earlier in this article, self-motivation cannot develop unless parents provide sufficient encouragement and their encouragement connects with the child's self (e.g., when encouragement is given when the child needs it and when the child feels secure and accepted within a loving relationship). Fortunately, self-motivation training can be an effective remedy when applied later in life at school, during training, coaching or therapy (Kuhl, Kazén, Koole, 2006; Renger, 2009; Storch, Kuhl, 2011).

In many cases, the causes of impaired instrumental initiative are even deeper than the self-motivation problem. Even intact self-motivational abilities do not suffice when explicit and implicit systems (e.g., explicit intentionality and the implicit self) do not cooperate smoothly. Presumably, the process of self-motivation requires some cross-hemispheric coordination to be put into effect: The implicit self with its affect generating capacity seems to be supported by the right prefrontal cortex (Kircher et al., 2002; Levesque et al., 2003; Molnar-Szakacs, Uddin, Iacoboni, 2005) whereas explicit (verbalized) intentions should typically depend on left hemispheric networks (Kimura, in press; Toga, Thompson, 2003). Hence, enactment of explicit intentions requires a coordination between a left hemispheric network maintaining the intention in an active (explicitly verbal) state and a right hemispheric network generating the necessary positive energy to overcome the unattractive valence of the instrumental steps to be taken. We can now understand why the discrepancy

between explicit communication and implicit experience during childhood mentioned at the beginning of this section can interfere with action control, that is the enactment of explicitly intended unattractive instrumental behavior. Symptoms that Freud explained in terms of a regression to the oral stage can be explained today in terms of an impaired interaction among (left hemispheric) explicit intentions (cf. Freud's ego) and (right hemispheric) experiential networks (i.e., the implicit self, not elaborated in Freud's theorizing) providing the motivational basis necessary to overcome the negative valence associated with instrumental steps toward the goal.

In this case, any intervention that supports the interaction between explicit intentionality and the implicit experiential system (i.e., the self) should alleviate problems to enact unpleasant instrumental behavior. The work by Oettingen and her associates (2001) mentioned earlier confirms this claim: Having participants alternate between positive fantasies about goal attainment (which should activate the right, experiential, hemisphere) and the difficult steps to be enacted (presumably activating the left hemisphere) significantly increases their volitional efficiency (i.e., the proportion of intentions enacted). Presumably, this alternation treatment improves the cooperation between the hemispheres, which is especially important when participants are locked into one of the hemispheres (e.g., when somebody is over-analytic or over-impressionistic, roughly comparable to the two types of insecure attachment, that is the avoidant and the ambivalent type: Blatt, Levy, 2003). To the extent that, in western (or westernized) countries, hemispheric over-activation more frequently affects the left than the right hemisphere, supporting shifts toward right-hemispheric processing may be especially useful. This hypothesis was confirmed in a recent study: Activating the right hemisphere restores self-access (Baumann, Kuhl, Kazén, 2005). In a similar vein, the overestimation of own body size observed in patients with eating disorders seems to be mediated by the left hemisphere (Smeets, Kosslyn, 2001) and can

be reduced by activating the right hemisphere (Kazén et al., 2011).

The distinction between approach and avoidance routes into high-level forms of behavioral facilitation (e.g., self-regulation vs. self-control, respectively) helps understand a paradoxical observation many patients report: As long as there is some external pressure or anticipation of negative consequences they can enact their intentions because they can utilize the self-control form of behavioral facilitation; but as soon as external pressure subsides, they have problems to initiate even simple instrumental activities (e.g., helping with domestic chores; tidying up one's desk etc.). In situations providing neither external pressure nor other sources of avoidance motivation impairments of action control are caused by those patients' problem to enter the self-regulation mode which would generate the positive affect needed to overcome the insufficient positive valence of instrumental activities.

The hemispheric coordination hypothesis may even be applied to explain some patients' problems in social interaction which seem to result from childhood experience of invalid communication involving a mismatch between explicit and implicit channels: Some of these patients have problems even in positive relationships because they keep worrying about the other person's emotional state or about other aspects of the relationship (e.g., whether it might break down when the other person discovers some negative side of the actor). It should be noted that those problems can occur without any hemispheric coordination problems because the mere content of such worries may interfere with smooth and gratifying social interactions. However, the functional view proposed by PSI theory provides an additional (or alternative) possibility: Worries can be the *consequence* of impaired hemispheric coordination rather than its cause. Presumably, individuals who have often been exposed to incongruence between implicit and explicit messages early in their lives have acquired a dissociation between explicit and implicit systems. This can result in automatic

dissociation even in positive contexts: For example when their implicit experiential system is activated by a mutually satisfying interactional experience (e.g., in a loving relationship), their explicit system often fails to become coordinated with this experience simply because of the learned dissociation between the two systems. In this case worrying thoughts that accompany and possibly interrupt the positive experience are the consequence of an acquired dissociation of the two hemispheres rather than its cause.

Having difficulties in completing one's intentions (i.e., when people are confronted with many demands) may reduce well-being (Baumann, Kaschel, Kuhl, 2005). People who habitually inhibit positive affect (e.g., characterized by a reserved, analytical, or schizoid personality style) report reduced well-being unless they can counterregulate reduced positive affect (Baumann, Kaschel, Kuhl, 2007). However, impairments of self-motivation and action control do not cause psychosomatic symptoms (Baumann, Kaschel, Kuhl, 2005). In the next section, I will discuss the dynamics underlying psychosomatic symptoms and some other disorders related to downregulation of negative rather than upregulation of positive affect.

SYMPTOMS RELATED TO INCREASED NEGATIVE AFFECT AND IMPAIRED SELF-GROWTH

Besides symptoms related to impaired action control there is another class of symptoms. These symptoms are typically characterized by impaired performance of complex tasks or tasks involving episodic or spatial memory. Additional symptoms of this category are rigidity when faced with changes in the environment and stress-dependent psychosomatic complaints which range from headache, back pain, stomach ulcers to insomnia, sexual malfunction and even impaired immune function (Sapolsky, 1992). Taking the PSI perspective, we can detect a common functional element across those phenotypically diverse symp-

toms: Each of them can be related to an impairment of some integrative function. Complex tasks such as dealing with an eco-system, managing a company or a city (Brehmer, Dörner, 1993) or making a complex decision require the integration of a variety of input information. Likewise, episodic and spatial memory systems are based on an integration of many pieces of information making up an autobiographical episode or a cognitive map of the environment, respectively.

Does flexible adjustment to new situations (i.e., overcoming rigid adherence to ongoing behavior) and adaptive modulation of the psychosomatic interface (e.g., unconscious regulation of bodily functions) also require some form of integration? I propose that this is the case. However, flexibility and psychosomatic regulation require a different form of integration compared to the complexity-based form. Specifically, flexibility and psychosomatic regulation are based on some "vertical" rather than horizontal integration: When a new situation arises (e.g., when in the Wisconsin card sorting test, the experimenter surreptitiously changes the category defining "correct" responses), a dominant (habitual) response category has to be inhibited and replaced by a new response category. Quickly installing this new guide for action requires some top-down (executive) control (Barceló, Knight 2002). In a similar vein, regulating emotions (e.g., by self-motivation or self-relaxation) and other somatic processes (including immune functions) also requires an intact top-down flow of control which is impeded by excessive stress even in animals (Schmajuk, DiCarlo, 1992).

In light of the substantial differences between horizontal and vertical forms of integrative competence, one may wonder whether it is justified to postulate a common mechanism affecting either form of integration. Within the PSI framework, the integrative self presumably has either potential: the (horizontal) integration of information across an extended semantic network (Baumann, Kuhl, 2002) and the vertical impact on elementary processes such as object recognition (Kuhl, 1981) or stress reduction (Quirin et al. 2009). Keeping

object recognition from unwanted “rumination” about an isolated discrepant detail like a failure or reducing the production of cortisol are examples of efficient top down regulation emanating from the implicit self (which does not “want” the rumination) and keeping object recognition from ruminating about task-irrelevant objects: This case can be depicted in Figure 1 by inverting the direction of the arrow connecting object recognition and extension memory. Affect regulation is depicted in Figure 1 by arrows from the implicit self (extension memory) to positive or (low) negative affect, respectively (cf. the arrows for self-motivation and self-relaxation in Figure 1).

It should be noted that, in PSI theory, personality functioning is not confined to the three levels of personality illustrated in Figure 1, that is the level of intentional control and self-regulation (intention and extension memories), the level of elementary perceptual and behavioral processing (object recognition and intuitive behavior control) and the level of positive and negative affect. PSI theory describes four additional levels of personality (Table 1): a level of temperament (global motor activation and sensory arousal), a pre-conceptual level of cognitive-emotional integration (imagery, motives), the level of con-

ceptual thinking (which closely cooperates with intention memory: Figure 1) and a stress-sensitive intermediate level that relays the impact of the three high level systems (i.e., pre-conceptual motives, conceptual thinking, and both intentionality and self-regulation) toward low level systems thereby regulating object perception (e.g., terminating rumination or sensitizing for self-congruent information), temperament (e.g., reducing overarousal or increasing motor activation) and modifying affect intensity as in self-motivation and to self-relaxation (see Kuhl, Koole, 2008, for a more detailed account of the seven levels of personality functioning in PSI theory).

Neurobiological evidence confirms the role assigned to the stress-sensitive intermediate level of personality functioning postulated in PSI theory: The hippocampus is a system which (horizontally, that is within levels of personality functioning) integrates elements making up autobiographical episodes (Squire, 1992) or spatial representations of the environment (Meaney et al., 1988). In addition, the hippocampus (vertically, i.e., across levels of personality functioning) relays top-down effects from neocortical networks toward subcortical networks involved in affect regulation, perception and (automatic)

Table 1. PSI theory differentiates 7 levels of personality functioning and subdivides each into a primarily behavior-focused and a primarily experience-focused system (with the possibility of secondary crossovers, e.g. when positive affect is contemplated rather than serving its primary function of behavioral facilitation or when negative affect energizes flight or fight behavior). Note: Levels included in Figure 1 are in *italics*.

Level	Behavior Focus	Experience Focus
7. <i>Volition</i>	<i>Intention Memory: Ego</i>	<i>Extension Memory: Self</i>
6. Cognition: Concepts	Local Goals, Plans	Global Goals, Meaning
5. Preconceptual (associative networks)	Effectance Motives (achievement, power)	Experiential Motives(affiliation, freedom)
4. Stress-dependent Pro- vs. Regression	Top-Down (Progression: moderate stress)	Bottom-up (Regression: excessive stress)
3. <i>Incentives</i> (affect-object links)	<i>Positive Affect</i>	<i>Negative Affect</i>
2. Temperament (global, opportunistic)	Motor Activation	Sensory Arousal
1. <i>Elementary Control</i>	<i>Intuitive Behavior Control</i>	<i>Object Recognition</i>

behavior control (Pruessner et al., 2005; Schmajuk, DiCarlo, 1992). The hippocampus has a high density of glucocorticoid receptors which are activated when the stress hormone cortisol exceeds a critical concentration. In this case hippocampal functions are inhibited (Sapolsky, 1992).

This mechanism provides a simple explanation of the common psychological basis of the symptoms related to impaired horizontal and vertical integration (i.e., deterioration in performance of complex tasks, rigidity, and psychosomatic symptoms): When stress intensity exceeds a critical level and cannot be down-regulated, the risk to develop those symptoms increases because of the impairment of horizontal and vertical integration which is presumably mediated by the hippocampus and all integrative functions drawing upon it (including the integrative self). From the perspective of PSI theory it is important to note that those integration-impeding effects are closely related to excessive negative affect rather than a reduction of positive affect (recall that we have identified the latter as a determinant of impairments of action control). An empirical test of the hypothesis that the stress hormone cortisol should be associated with impaired self-access confirmed this hypothesis by showing that an increase in cortisol after a stress induction predicted self-infiltration, that is the number of false self-ascriptions of tasks that were chosen by another person (Quirin et al., 2009; recall that self-infiltration can be regarded as a consequence of impaired self-access).

The difference between symptoms related to excessive negative affect and those related to insufficient positive affect suggests making a careful distinction between two different types of stress, that is one resulting from excessive negative affect (i.e., threat) and another one resulting from (emotionally) difficult intentions (i.e., demands) which dampen positive affect needed for instrumental activities (cf. Higgins, 1987, for a similar distinction). The former type of anxiety-prone stress associated with increased negative affect has been related to hippocampal malfunction whereas the latter type of depression-prone stress is as-

sociated with dampened positive affect resulting from an overload of uncompleted intention and impairments of action control. When the two types of stress are assessed separately, their predicted consequences can be clearly distinguished: People reporting high demands in their everyday life (e.g., many uncompleted intentions) show significantly reduced well-being, but no increased risk of developing psychosomatic symptoms (Baumann, Kaschel, Kuhl, 2005). On the other hand, the same study demonstrated that an increased level of everyday threat-related stress (involving high negative rather than low positive affect) did increase psychosomatic risk across a variety of symptoms (assessed with the Symptom Checklist by Derogatis et al., 1974). Finally, the study revealed a hypothetical index of the degree of dissociation between explicit and implicit self-representations (implicit measures vs. explicit self-ratings of one's achievement motive) as a mediator between demanding or threat-related stress and reduced well-being or psychosomatic symptoms, respectively (Baumann, Kaschel, Kuhl, 2005).

Dissociation between explicit goals (self-reported motives or needs) and implicit motives or needs is important source of reduced well-being or increased psychosomatic risk (Baumann, Kaschel, Kuhl, 2005; Brunstein, Schultheiss, Grässmann, 1998). When self-reported needs or motives (assessed with questionnaires) underestimate the actual strengths of needs and motives (assessed through projective or operant methods such as the Thematic Apperception Test), people do not form explicit goals that satisfy their needs. Conversely, when people overestimate their needs and motives, they are likely to form explicit goals that are not emotionally supported by their needs. In an ongoing project we replicated our earlier findings (Baumann, Kaschel, Kuhl, 2005) demonstrating discrepancies between explicit and implicit motives in patients suffering from diverse psychosomatic symptoms. Interestingly, different motives were relevant for different nosological categories: Depression was associated with a discrepancy between explicit and implicit needs for affiliation (commun-

ion), substance abuse (alcoholism) was associated with discrepancies between explicit and implicit power motives, and a dissociation between explicit and implicit achievement needs was observed in patients suffering from an overload of daily duties, including burn-out symptoms (Kazén, Kuhl, 2011).

It should be noted that, according to PSI theory, affect regulation is more crucial for symptom formation than affective sensitivity as assessed by anxiety scales or extraversion and neuroticism (i.e., two of Big Five personality factors: McCrae, Costa, 1987). In fact, the emotional dialectics underlying healthy action control and self-development (see Figure 1) suggests that even strong sensitivity to negative affect or low sensitivity to positive affect can have beneficial effects on self-growth or action control, respectively, provided those affective states can be counter-regulated through appropriate affect-regulatory abilities (i.e., self-motivation to counteract low positive affect or self-relaxation to down-regulate high negative affect). In other words, the theory predicts that even strong negative emotional sensitivity as indicated by high scores on traditional personality scales (e.g., introversion, neuroticism, anxiety etc.) can be a basis for efficient action control and successful self-growth over the life span (as a buffer against psychosomatic illness) provided the primary negative response to new situations can be counterregulated by effective affect-regulatory competencies resulting in a less negative secondary response.

This hypothesis has been confirmed in a study examining 154 patients suffering from diverse psychosomatic symptoms (Baumann, Kaschel, Kuhl, 2007): For example, a highly avoidant personality style (i.e., apprehensiveness toward social evaluation) was associated with increased risk of developing symptoms only in patients whose ability to downregulate negative affect was insufficient. A highly avoidant, compared to an emotionally more robust, style even turned into a source of protection against symptoms (as indicated by a significantly reduced risk to develop psychosomatic symptoms), provided it came along

with efficient affect regulation. This counter-intuitive (but theoretically expected) finding can be explained on the basis of the emotional dialectics presumably underlying self-development: High sensitivity toward negative affect increases awareness of experiences that are difficult to integrate (and which emotionally stable people might ignore); when this sensitivity is combined with effective downregulation of negative affect, painful experiences can be integrated into a growing self system (Figure 1).

A particularly severe condition is the case when the two types of stress or the two types of affect regulatory impairments coincide: When low positive affect is closely intertwined with high negative affect, PSI theory predicts the severe situation that the two basic competencies of healthy personality functioning (i.e., action control and self-access) break down simultaneously. This condition may have serious implications for healthy personality development and for therapy success (Cordero-Prantl, 2005): As long as only one of the two basic functions (i.e., action control or self-access) is impaired, the intact function may compensate for deficits in the other function, at least to some extent. This assumption can be tested by examining the interaction between low positive affect (e.g. listlessness or dejection) and high negative affect. If the combination of those two conditions is especially conducive to developing symptoms, those conditions should form a significant interaction in producing adverse effects in a patient sample, but not in a sample of psychologically healthy individuals. In a recent pilot study, this expectation was confirmed: Within a sample of psychosomatic patients there was an interaction between self-reported listlessness (i.e., low positive affect) and negative affect on a measure of generalized hopelessness which turned out to be an indicator of symptom severity and reduced effectiveness of therapy. In contrast, a similar analysis conducted in a non-clinical sample of university students yielded only additive main effects of listlessness and negative affect on occasional feelings of hopelessness.

These findings suggest that, in normal personality functioning, action control and self-development can operate independently when necessary. In contrast, in clinical patients, symptoms may be aggravated and therapy rendered more difficult, when impaired action control interferes with self-development (e.g., learning from mistakes) and vice versa or, to put it in more basic terms, when negative affect dampens positive affect or vice versa. It is not difficult to imagine the developmental precursors of this confounding of the two affective dimensions that are normally driven by independent neuropsychological systems (Berntson, Cacioppo, 2008) and can also be separated from a developmental point of view (MacDonald, 1992): When parents respond to situations involving negative affect (e.g., a child has hurt herself) with admonitions (i.e., activating intentions like “you have got to pay more attention in the future”), a dampening of positive affect is conditioned upon the experience of negative affect (recall that any activation of intention memory can dampen positive affect). The coupling between the positive and negative affective systems can also be caused by the opposite condition, that is when caretakers respond to a reduction of positive affect (e.g., a child has lost a toy) with an induction of negative affect (e.g., through getting nervous or resorting to verbal or physical punishment).

Another serious source of impaired action control and psychosomatic regulation requires an even deeper level of analysis: Dysfunctional coupling of affective dispositions can also happen at an even more elementary emotional level. The source of this condition can be located at the level of temperament (Table 1) which dominates emotional life during the first months of infancy, even before reliable bonds between specific objects and positive or negative affects are made (that is before “object permanence” has developed and incentive motivation dominates behavior). Emotions generated at this elementary level of personality have been called “proto-emotions” (Arieti, 1967) to denote their inarticulate and seemingly “irrational” status which may partly be attributable to the fact that they do not form reliable bonds

with objects. Instead, they diffusely emanate from several (often unintelligible) sources in the internal and external environment (e.g., unconscious needs, implicit stressors etc.). The proto-emotion which is especially relevant for understanding impairments of action control and psychosomatic disorders is called *tense arousal*. This proto-emotion is characterized by increased sensory arousal (comparable to negative affect) combined with inhibited motor activation (comparable to inhibited positive affect) which amounts to another example of affect confounding (i.e., the coupling of positive and negative affects). Presumably, this combined proto-emotional condition can occur when caretakers fail to satisfy the infants needs (e.g., when mother is depressed, stressed or emotionally rejects her child).

What is it that makes proto-emotions such as tense arousal have an impact on positive and negative affect? According to PSI theory, tense arousal simultaneously dampens positive and intensifies negative affect: Motor activation and sensory arousal are two forms of temperament that can intensify positive and negative affect, respectively (Diener et al., 1985; Lang, 1995). As a result, similar symptoms can be expected as discussed for low positive and high negative affect (i.e., impairments of action control and self-access or self-growth). In addition, tense arousal can cause hemispheric dissociation, even without incongruence between explicit and implicit channels happening between the child and his or her caretakers during later (verbal) stages of development. For example, when, later during development, a child or adolescent tries to make sense out of his inability to motivate himself for instrumental activities (“Why is it so difficult for me to keep my things in order or to study a difficult lesson?”) or when he or she, during adulthood, is confronted with some consequence of his or her impaired self-access (“Do I have the right size, the right weight, the right preferences?”), the explicit system may fill the explanatory gap with more or less acceptable constructions: “I am too fat”, “I am not interested in difficult topics at school” etc. (Note that self-access is necessary for developing a realistic

body image because the self-system is closely intertwined with somatic representations: Bechara, Damasio, Damasio, 2000). Training and therapy is more difficult when hemispheric dissociation and impairments of action control and psychosomatic regulation have their roots at the level of temperament: At this level, affect regulation is much more difficult (e.g., because the true source of an emotional response cannot be discerned) and, as a result, mentalization is rendered very difficult even if basic mentalization skills have been acquired during childhood: It is hard to form a mental representation of one's emotional state unless one can relate it to any source or object that elicited that emotion.

CONCLUDING REMARKS

In conclusion I may summarize the contribution of PSI theory to our understanding of symptom formation: Impairments of the interaction among psychological systems necessary for action control and self-growth (including self-access) can contribute to the development of symptoms, over and above effects of psychodynamic conflicts, unfavorable learning conditions (e.g., rewarding dysfunctional cognitive schemas or behavior), or unconscious attempts to manipulate family members (cf. Freud's "secondary gains from illness" or similar arguments proposed by early behaviorists). An additional or alternative developmental determinant of those deficits can be an impaired development of affect regulation which in turn can result from caretakers' failure to provide sufficient self-sensitive encouragement or relaxation during childhood and/or from invalid feedback causing a dissociation between the child's explicit and implicit processing systems.

Poor self-regulation of affect can even develop when the frequency of encouragement

or relaxation received from caretakers has been high: Affect-regulatory experiences cannot be integrated into the self system unless the self is active during interactional episodes in which those encouraging or relaxing interventions occur. The self is active when an individual expresses his or her emotions or other mental states and (especially in later stages of development) when an individual feels understood and accepted as a person (i.e., as a whole including his past, present and future inclinations and experiences). In other words, even frequent encouragement and relaxation provided by caretakers cannot promote the development of self-motivation or self-relaxation, respectively, unless it occurs within a personal context in which the child feels understood and accepted as a person (otherwise the self is not activated and affect-regulatory experiences cannot be integrated into it).

Finally, even when developmental conditions for affect regulation have been optimal, an impaired coordination between hemispheres can interfere with the utilization of affect-regulatory skills for action control or self-growth: For those two fundamental personality functions some coordination between one explicit and one implicit mental system is required in addition to self-regulation of affect: the coordination between intention memory and intuitive behavior control is needed for action control and the coordination between object recognition and the implicit self is required for self-growth (integrating a single painful or self-alien experience into the extended self). The functional account of symptom formation provided by PSI theory can be applied for a better understanding of the mechanisms underlying various interventions in training and therapy (Kuhl, 2007; Kuhl, Kazén, Koole, 2006) and it can be used to develop additional methods for alleviating impairments of action control and psychosomatic regulation (Storch, Kuhl, 2011).

NOTE

¹ I would like to express special thanks to Brigitte Ruploh for helpful and inspiring discussions on the intricacies and paradoxes discernible across a variety of mental disorders.

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