Individual Differences in Self-Regulation

13

Julius Kuhl

Even a casual observer of human behavior can see that there are profound differences in how individuals regulate their actions. Some individuals doggedly pursue a single goal or ideal for many years, making many personal sacrifices and at great personal cost. Others seem to give in to their immediate impulses with barely a thought for the consequences. Some students earn their highest grades under severe stress and in the face of adversity. The same levels of stress and adversity may lead other students to drop out and abandon their academic goals altogether. Indeed, many students seem to perform best under more relaxed conditions. At the workplace, some employees demonstrate high levels of initiative and set their own agenda, regardless of what others may think. Others prefer to follow the instructions of their superiors and are eager to learn what is expected of them.

These and other individual differences in self-regulation are the central focus of the present chapter. The following sections offer some preliminary reflections on the neglect of individual differences in psychological research. Next, the chapter considers individual differences in motives and needs and how global notions of self-regulation and the will can be decomposed into more specific psychological functions and mechanisms. Finally, this chapter shows how this functional analysis of the will can be used to understand a wide array of effects of individual differences in affect regulation (i.e., action vs. state orientation). Throughout the present chapter, the overarching goal is to illuminate the basic psychological functions that may underlie individual differences in self-regulation.

13.1 Reflections on the Neglect of Individual Differences in Psychological Research

There is still no general consensus among experimental psychologists on the significance of individual differences. It therefore seems appropriate to begin this chapter with some reflections on individual differences in self-regulation. Most cognitive psychologists and many social psychologists take no account of individual differences. The reasons for this neglect are not discussed systematically in psychology. In fact, wherever the exclusion of individual differences occurs, it seems to be based on a tacit a priori assumption rather than an explicitly discussed decision. When asked about their reasons for disregarding individual differences, researchers often cite sociopolitical arguments. As they see it, paying

Thanks are due to Sander Koole for helpful comments on an earlier version of this chapter.

J. Kuhl (✉)
Universität Osnabrück, Institut für Psychologie, Osnabrück, Germany
e-mail: jkuhl@uos.de

J. Heckhausen, H. Heckhausen (eds.), *Motivation and Action*,
https://doi.org/10.1007/978-3-319-65094-4_13

attention to dispositional factors risks missing opportunities for social change. This kind of thinking is based on the assumption that situational influences are always easier to change than individual ones. Yet we know from everyday experience that people are often exposed to situational influences that are not easily changed, such as a chronically ill relative, a low income, or a floundering economy.

Note that personality characteristics are not necessarily fixed and unchangeable. The laws of falling bodies in physics, which take account of individual differences in the mass of falling objects, do not require this variable to remain unchanged across the "lifespan" of an object. The only constraint is that there is no change in the measured mass of an object, while each individual measurement is taken and the laws are applied (incidentally, the same applies to situational factors). If the mass of the object changes (e.g., because fragments of the stone under investigation break off), this change is taken into account in the next measurement, before the laws are applied again.

Against this background, neglecting personality characteristics in psychological research is like throwing the baby out with the bath water. Rather than excluding personality dimensions from their work altogether, researchers critical of the static nature of psychological concepts of personality might want to put some thought into the true nature of personality dispositions. Psychology needs a dynamic rather than static conception of personality. One such theory is presented in Sect. 13.5: The theory of Personality Systems Interactions (PSI) assumes that individual dispositions play a role in the ever-changing exchange of information between psychological systems. Depending on the social context of the interaction, this exchange of information in turn has the potential to influence and change personality functioning.

Besides the sociopolitically motivated reluctance against the study of personality, there is another, even more deeply rooted reason for the widespread neglect of dispositional determinants of behavior. It is based on the misunderstanding that the pursuit of general laws, which is, of course, critical for a young experimental science like psychology, would be impeded if different laws were allowed to apply to different people. If there were idiosyncratic laws for each individual person, so the reasoning, there would be no room for a general psychology. This concern seems to be influenced by the development of experimental psychology in the first decades of the twentieth century. Specifically, the beginnings of experimental psychology were characterized by enormous difficulties in abandoning the introspective "observation of the soul" that psychologists associated with "armchair psychology" and that seemed incompatible with the agenda of the newly emerging experimental discipline. The experimental psychologists of the time, who called themselves "behaviorists," only accepted observations that could be made directly and from an external perspective as the basis for the development of scientific psychology; they sought to discover general psychological laws.

Even today, researchers who take individual differences into consideration are sometimes implicitly suspected of obstructing that agenda, which is of existential importance for scientific psychology. In reality, however, there is no inherent contradiction between personality psychology and a psychological science in search of general law. Again, comparison with laws of nature, such as the laws of falling bodies, helps to illustrate the point. No physicist would ever suggest that averaging the masses of a random sample of objects would produce more general laws of falling bodies. Clearly, the laws of falling bodies are only generally applicable if the individual characteristics (i.e., the mass) of the object in question are included in the equation. The findings on individual differences in self-regulation (e.g., action vs. state orientation) reported in this chapter indicate that – in psychology as in physics – results are only replicable when individual characteristics are taken into account.

- Failure to measure unwelcome potential influencing factors – e.g., personality dispositions that are believed to reduce the general applicability of a law – does not constitute scientific rigor; on the contrary, it is a parascientific denial strategy. Scientific "objectivity" requires researchers to consider all potential

influencing factors and, if their influence can be established, to incorporate them in psychological "laws." General applicability of a paradigm cannot be achieved simply by ignoring influencing variables. In other words, individual differences whose influence has been established empirically lend general applicability to models that do not a priori include personality parameters (Lewin, 1935).

13.2 Motives as Need-Oriented Self-Regulatory Systems

Motivation psychology is concerned with what motivates people to behave in certain ways. Different approaches offer very different answers to the question of what these motives are. The idea that cognitive representations of goals motivate behavior has been popular for a long time now (see Brunstein & Maier, 1996; Cantor & Zirkel, 1990; Emmons, 1992; Little, 1989). The advantage of the focus on cognitive motives for behavior is that it coincides with what is currently the most fruitful area of psychological research: In formulating cognitive theories of motivation, researchers are able to capitalize on both the theoretical and the methodological advances of cognitive psychology within the study of human motivation. An exclusive focus on the cognitive determinants of behavior does not paint the whole picture, however. Even if I know which cognitively represented goals an individual is pursuing, I still do not know why this person has set himself or herself those particular goals and whether a cognitive representation of a goal is a necessary condition for motivated behavior or whether behavior may be motivated by sources other than conscious intentions and other cognitive sources of motivation (Kuhl, 2010).

Other sources of motivation we might consider are needs and affects that are not cognitively represented (e.g., if a person starts talking to somebody because of his or her need for closeness but is unaware of that need and has not consciously set himself or herself the goal of satisfying it). Furthermore, we do not know whether the existence of a goal is a sufficient condition for engaging in the corresponding behavior. In fact, as will be discussed in the present chapter, whether or not a cognitively represented goal is translated into action hinges largely on regulatory processes that are described by the terms self-regulation, volition, or will.

13.2.1 Needs: Subaffective Detectors of Discrepancies Between Actual and Desired States

Self-regulatory processes are also investigated in fields of psychology other than motivation psychology, e.g., as "executive processes" in cognitive psychology (Chudersky & Smolen, 2016; Norman & Shallice, 1986) and as central coordinating processes in the frontal lobe in neuropsychology (Damasio, Tranel, & Damasio, 1991; Friedman & Miyake, 2016; Wheeler, Stuss, & Tulving, 1997). To appreciate the specific perspective that the motivational approach brings to volitional processes, it helps to consider some of the key terms and concepts of motivational theory. To come back to the defining question of motivation psychology introduced above, what are the processes that determine the goals that people set themselves?

Definition
Motivational processes that are not characterized by cognitive representations of a target state can be called *precognitive* or *subcognitive*, because they exist even before cognitive goal representations are generated.

Neurobiology attributes these subcognitive processes to brain structures that, in terms of phylogeny, ontogeny, and brain anatomy, are located "below" the structures mediating cognitive representations. These subcognitive structures may be regarded as detectors of discrepancies between actual and desired states, similar to the detectors in the hypothalamus that are known to monitor blood sugar level, which plays a major role in feelings of hunger and motivating food intake (Leibowitz, Weiss, Walsh, & Viswanath, 1989). These detectors are more comparable with mechanical detectors of discrepancies between

actual and desired states (e.g., thermostats) than with cognitive representations. In case of a discrepancy between actual and desired state, a thermostat is able to regulate the temperature without "having a goal in mind."

Definition
Needs may be defined as subcognitive and subaffective detectors of discrepancies between actual and desired states.

Animal experiments show that subcognitive motivational processes can regulate behavior. Specifically, electrical or chemical stimulation of certain nuclei in the hypothalamus has been shown to trigger motivated behavior, such as attacking, suckling, drinking, grooming, etc., independent of the brain structures involved in generating cognitive representations (e.g., when the cortex and hippocampus have been inhibited or removed; Clemente & Chase, 1973; Himmi, Boyer, & Orsini, 1988; Pawlow, 1930/1953, p. 369; Peck & Blass, 1975).

Freud popularized the assumption that human behavior is motivated by basic (subcognitive) biological needs (drives). Starting from the energetic basis common to all drives (libido), which he associated with the drive to procreate, Freud differentiated needs such as:

- The need to eat (oral)
- The need to exercise control (anal)
- The need for love (genital)

The psychoanalytic school is known for its propensity to attribute the needs manifested in adulthood to basic drives and the childhood experiences ("vicissitudes") associated with them. Psychoanalysts assumed that individuals whose oral needs are either over- or undersatisfied in childhood will develop a fixation not only on needs that are directly linked to the intake of food (drinking, eating) but also on needs associated with the need for food and drink in early infancy, e.g., the needs for skin contact, closeness, and a sense of security (oral dependency). The reasoning was that early experiences of feeding are closely linked to the satisfaction of needs for contact and a sense of being cared for.

13.2.2 Affective and Cognitive Systems: Need-Relevant System Configurations

Psychoanalysts were mainly concerned with explaining pathological development and paid much less attention to healthy psychological development. If we were to take a similar approach to inferring the needs that develop from an infant's oral needs in the case of healthy development – i.e., when oral needs are neither over- nor undersatisfied – we might assume these needs to be strongly associated with independence, rather than with dependence. In a normally developing child, the need for food can be seen as prototypical of a need that progresses from being satisfied in a dependent manner to being satisfied in an ever more independent manner. The child becomes increasingly independent of the mother – skin contact is no longer necessary during food intake, children learn to feed themselves, and gradually begin to decide by themselves what to eat and drink and what to reject. They also find more and more ways to obtain the food they want, even if that food is not actively provided by the mother or is forbidden, i.e., if difficulties (obstacles) are to be overcome.

Looking at the manner in which a need is satisfied rather than its actual content, we can even discern a gradual progression from the need for food to other needs that likewise imply increasing independence. The prototype here is the need for achievement, which centers on the attainment of difficult goals and development of the necessary skills. Early studies on the achievement motive confirmed that independence is indeed a basic prerequisite for the development of the need to achieve. Winterbottom (1953) found that individuals whose mothers emphasized their child's independence from an early stage (e.g., who let them do things without help or interference) tended to produce Thematic Apperception Test (TAT) stories on achievement-related themes. Likewise, Scheffer (2005) found that when adults who associated a large number of achievement-related contents in response to various stimuli (i.e., who had a high achievement motive) were administered an indirect test on the structure of the family of origin, they portrayed their mothers

as interfering little in their affairs, i.e., as allowing them a great deal of independence.

These mothers do not always show their support for their child but withhold warmth in certain situations (i.e., they let their child experience the frustration associated with the difficulties encountered). The child then will then seek his or her own solutions to the problem, i.e., engage in instrumental behavior.

- Instrumental behavior (i.e., behavior that is used as an "instrument" to achieve a certain purpose) is one of the foundations of achievement-related behavior. Accordingly, some researchers have measured the strength of the achievement motive in terms of the frequency of imagined instrumental actions (Atkinson, 1958; Heckhausen, 1963a; McClelland, Atkinson, Clark, & Lowell, 1953).

Empirical evidence for the assumption that patterns of oral need satisfaction established early in life (e.g., whether or not a child is encouraged from an early age to eat and drink without help) influence the development of the achievement motive is still lacking. However, the fact that animal experiments typically investigate the prototype of achievement-related behavior (i.e., instrumental behavior) in the context of food intake (Carlson, 1994; Skinner, 1953) might point to a link between the two needs.

13.2.2.1 Needs for Achievement and Power

On the affective level, instrumental behavior is characterized by a typical cycle that begins with the inhibition of positive affect whenever a difficulty or obstacle is encountered. As soon as instrumental behavior succeeds (e.g., a rat finds food in a maze), the second part of the cycle commences. Inhibition of positive affect can now be released. In his influential theory, Gray (1982) describes this frustration effect as an inhibition of the system that facilitates behavior (otherwise known as the reward system). Gray reports numerous experimental findings in support of his theory. If there is no obstacle to be overcome, the system facilitating behavior and the associated positive affect need not be inhibited, and consummatory behavior can be initiated without delay. For example, humans or animals can simply eat the food available without first having to engage in instrumental behavior to obtain it.

The problem with inhibition of positive affect, which this model of achievement motivation sees as the starting point of each instrumental cycle, is that it entails the risk of behavioral inhibition lasting too long. A minimum amount of positive affect seems to be necessary (for many forms of instrumental behavior, at least) to muster the energy needed to facilitate behavior (Gray, 1982). Various models of motivation (see Atkinson, 1964a; Heckhausen, 1989) have proposed a simple solution to the paradox of how an organism can be motivated before the positive affect associated with goal attainment takes effect. The assumption is that moderate levels of positive affect can be generated during the instrumental phase by the anticipation of goal states. This effect is described by the concept of incentive, according to which the sight or mental image of an aspired object suffices to generate positive affect and to facilitate behavior.

Definition

From a functional perspective, the concept of incentive can be likened to Freud's concept of object cathexis. After repeated positive experiences with an object, the cognitive representation of that object also becomes associated with positive affect (or with negative affect in the case of aversive experiences). What Freud termed object cathexis, Lewin (1935), in his theory of motivation, called "incentive character" or "valence." Today, in the language of learning theory, it is described as the conditioning of an affect onto an object representation (i.e., a stimulus). The term incentive, which is a core concept in motivational theory, denotes the association between a stimulus (or, more specifically, an object representation) and the affective reactions conditioned onto it, which motivate approach or avoidance behavior.

In their model of affective change (McClelland et al., 1953), McClelland and associates proposed that the change from inhibited to activated positive affect seen in instrumental behavior corresponds closely with the affective processes characteristic of achievement motivation. Achievement motivation presupposes a minimum degree of difficulty or – as Heinz Heckhausen (1963a) put it – achievement-motivated behavior can only occur "if one can manage a task or fail at it". The shift from inhibited to activated positive affect (i.e., from the perception of difficulty to the anticipation of success) can also apply to power motivation (although not with the frequency typical of achievement motivation): expressing one's feelings and goals in order to influence others (i.e., asserting oneself or exercising power) often constitutes a use of instrumental behavior to attain certain goals.

13.2.2.2 Affiliation and Self-Integration Needs

The affective cycle typical of instrumental forms of motivation (i.e., achievement motivation and power motivation) does not apply to all needs. Instrumental behavior is rather untypical when we seek, for example, to establish or maintain positive, warm, or even loving relationships with others (i.e., need for affiliation or the intimacy motive; Chap. 7). Indeed, instrumental behavior may even disrupt the spontaneous exchange of feelings that is characteristic of close interpersonal relationships. Because instrumental behavior is directed toward a specific goal or purpose, it is bound to strike us as manipulative or false – or at the very least as lacking in spontaneity – when exhibited in social interactions.

- Positive affect (e.g., agreeableness or warmth) facilitates the establishment of interpersonal relationships; it is also the basis for the expression of negative feelings: Any reduction of positive affect inhibits behavior (including emotional expression). Note that negative affect is not identical to inhibited positive affect, which plays a crucial role in achievement motivation. Inhibition of positive affect is extremely disadvantageous in social interactions, whereas we soon learn that expressing negative feelings prompts others to provide care and to display loving behavior (e.g., when an infant's crying expresses a need that is then satisfied by the mother).

The connection between low positive affect and impaired personal relationships is especially apparent in depression, where the loss of positive affect is extreme. Empirical findings indicate that depression is more closely related to a lack of positive affect (e.g., despondency) than to the presence of negative affect (e.g., agitation or anxiety; Higgins, 1987; Watson & Tellegen, 1985; Winer & Salem, 2016). In fact, depression has much more detrimental effects on social relations than anxiety and other negative feelings (including suicidal feelings; Milana, 1981; Spirito & Hartford, 1990). Satisfying social interactions thrive on the exchange of positive feelings, and the absence of positive emotions can have more harmful effects on relationships than the expression of feelings such as anxiety, discussion of which can in fact strengthen relationships (Gilligan, 1997, 2013).

The second motive that presumably is more experiential than instrumental concerns the need for becoming an authentic person by integrating self-compatible experiences into a growing self. Developing an integrated and authentic self is often even undermined by instrumental planning (Fromm, 1976). Feeling free for and open to new experience is facilitated by an experiential rather than instrumental (behavioral) focus (Kuhl & Hüther, 2007; Kuhl & Luckner, 2007). In the humanistic tradition of motivational psychology, authenticity and self-integration are closely related to consciously reflected self-determination (Deci & Ryan, 2000; Rogers, 1961). This close relation between self-integration and *deliberate* self-determination shows a great respect for the individual and his or her conscious reflections as the highest moral authority. In light of the growing consideration of the limitations of the (analytical) consciousness (Deglin & Kinsbourne, 1996; Gigerenzer, 2000), the honorableness and the responsibility of human beings can be even more deeply acknowledged if we expand our conception of self-determination by including the unconscious (intuitive) intelligence of the self.

Following this approach, Alsleben (2008) extended a content-analytic method for assessing implicit needs by categories that indicate various forms of ~~the~~ satisfaction of the need for authenticity and self-integration (Alsleben & Kuhl, 2010).

Alsleben decomposes the need for self-integration (i.e., the need to feel free to open up to experience and authentic being) into the categories *self-confidence* (e.g., to open up, delight in new experiences, display positive self-esteem), *status* (conditional self-confidence, e.g., being the center of attention), unrestrained *self-awareness* (integration of unpleasant experiences, restoration of self-confidence, assertiveness, asking for advice), defensive *self-protection* (building rigid ego borders, justifying one's actions, perceiving oneself in comparison with others), and *self-denigration* (fear of losing freedom, losing self-confidence, misunderstanding or being misunderstood, being charged, being under pressure). Some of those categories have been associated with the need for power (e. g., status, assertiveness). However, an empirical study revealed distinct differences between the need for free self-integration and the need for power: After the presentation of words (as primes) expressing limitations of freedom (obeying, being dependent), the fear of losing power correlated significantly with the abovementioned measurement of volitional facilitation (reduction of the Stroop interference after positive primes: Kuhl & Kazén, 1999). On the other hand, the fear of losing self-esteem or self-integration was associated with a *lack* of volitional facilitation, which is consistent with the Fromm's (1976) hypothesis that the self-integration motive (authentic being) is related to an experiential rather than instrumental state of mind. In contrast, power typically requires volitional action, which is called "instrumental" because it involves enacting behavior that is instrumental for accomplishing a future goal. Findings showing that the left hemisphere is closely related to analytical thinking and instrumental planning (Deglin & Kinsbourne, 1996; Levy & Trevarthen, 1976; Rotenberg, 1993) suggest that instrumental motives such as power and achievement should activate the left hemisphere and experiential motives such as affiliation and self-integration should activate the right hemisphere. Empirical findings are consistent with this expectation (Kuhl & Kazén, 2008).

13.2.3 Implicit Motives: Intelligent Needs Serving the Context-Sensitive Regulation of Behavior

To understand how theories of motivation came to incorporate volitional concepts, it is important to appreciate the difference between needs and motives. In the latter half of the twentieth century, psychologists addressing the perhaps three most important social needs (i.e., affiliation/intimacy, power/assertiveness, and achievement) essentially studied motives rather than needs, although the lack of distinct measurement methods meant that it was not always possible to differentiate clearly between the two (Atkinson, 1958; Heckhausen, 1989; McClelland, 1985). One major reason for the shift of focus to the motive concept is clear. With the birth of behaviorism in the early 1920s, psychologists adopted a new agenda that emphasized the prediction of behavior (as opposed to the traditional experience-based "armchair" psychology), and it was now vital to identify motivational concepts that might further this aim. Simply knowing that a person has a need does not allow conclusions to be drawn on how he or she will behave. Needs were defined above as subcognitive or precognitive detectors of discrepancies between actual and desired states. In fact, we can go so far as to describe them as sub- and pre-affective. Typically, affect occurs only in consequence of a change in either satisfied or unsatisfied needs, i.e., when discrepancies between actual and desired states are reduced or increased (Heckhausen, 1963b):

- Positive affect can occur when a discrepancy is reduced (e.g., when there is an increase in blood sugar level after a meal).
- Negative affect can occur when the discrepancy between an actual and a desired state increases.

Needs may trigger behavior without the involvement of higher cognitive structures, as shown by the animal experiments cited above, in which certain nuclei of the hypothalamus were stimulated. The range of behaviors triggered at this subcognitive and subaffective level is rather narrow and inflexible, however (e.g., clinging to anyone available in the case of need for affiliation or sucking movements in the case of hunger). The potential for varied and adaptive behavior in humans is dependent on the involvement of complex cognitive structures and on the experience of countless previous episodes of need satisfaction. Thousands of experiences of behaviors in different situations are stored in autobiographical memory (Philippe, Koestner & Lekes, 2013; Tulving, 1985); these memories include the conditions prevailing at the onset of each episode, the range of behavioral options tested, and the consequences of those behaviors, including the emotions triggered. Comprehensive networks of need-relevant knowledge and behavioral options can be abstracted from these experiences. These networks, commonly known as motives (McClelland, 1985), allow us to predict behavior much more reliably than do the corresponding needs. Given the innumerable experiences an individual gains over the course of a human lifetime, however, these networks are so extensive that most of this knowledge is available only intuitively. Only some aspects of it can be verbally explicated, provided that the individual in question is capable of accurate self-perception. The cognitive component of motives differs from goal cognitions and other conceptual representations. Motives are preconceptual, often even preverbal, that is, they emanate from a developmental phase during which children may make need-relevant experiences but are not able to express them conceptually or even verbally. Children store pictorial scenes evolving from situations in which some experience occurred that satisfied or frustrated a particular need (Schultheiss, 2010).

Definition

Motives are extensive, not fully conscious cognitive-emotional networks encoded in a pictorial-concrete format that have been abstracted from autobiographical experiential knowledge to generate a large number of context-sensitive behavioral options as soon as a current need, which constitutes the nucleus of each motive, increases.

This definition of the motive concept is consistent with classical definitions (Atkinson, 1958; Heckhausen, 1989; McClelland et al., 1953). However, these did not always differentiate clearly between motives and needs – partly because methods allowing such a distinction to be made had yet to be developed.

13.2.3.1 Motives as Implicit Self-Representations

From the definition of motives formulated in the preceding section, it is clear that there is a close connection between motives and self-regulation. Autobiographical experiential knowledge forms the core of self-representations (Wheeler et al. 1997). Indeed, the highest level of representation of an individual's integrated self is based on the storing of all experiences that are, directly or indirectly, relevant to that person's current state, needs, and functioning. On the basis of these numerous "self-relevant" experiential episodes, individuals develop a more or less coherent model of themselves that can be updated at any time.

- Needs are core components of self-relevant states; motives are their cognitive-emotional elaboration. Based on experiential knowledge, motives tell the individual which behavioral options are particularly likely or unlikely to facilitate need satisfaction in specific situations. They can thus be regarded as integral components of the individual's self-system.

The link between a person's self-system and his or her motives has only recently become theoretically explicable (Kuhl, Quirin & Koole, 2015). For one thing, the motivation psychology of previous decades focused more on the measurement and validation of motives than on the functional architecture of motivated systems and their mechanisms (Atkinson, 1958a; Heckhausen, 1989; McClelland et al., 1953; Winter, 1996). Moreover, the connection between the high level of integration of the self-system, on the one hand, and motives, on the other, was not evident, because self-representations were studied almost exclusively in terms of self-concepts; i.e., consciously held views of one's self, whereas motives are essentially related to implicit representations. Whether or not researchers are able to capitalize on the great potential of the link between motives and self-regulation will depend on whether these theoretical advances are complemented by advances in the measurement of motives, as discussed in the next section.

13.2.3.2 Measurement of Motives

From the very beginning of experimental research on motives, these constructs have been assessed by means of projective measures (McClelland et al., 1953) and conceived of as largely unconscious cognitive-emotional representations. "Cognitive-emotional" means that motives are partly cognitive in nature (e.g., preconceptually encoded experiential knowledge about behavioral options in various need-relevant situations) but that they also have emotional aspects. Indeed, cognitive representations of need-relevant experiences are practically always associated with emotional experiences, dependent on the degree to which need satisfaction was achieved in the respective situations. From the perspective of learning theory, we could say that emotional responses (e.g., joy about success or disappointment about failure) have been conditioned onto cognitive representations of past actions.

Today, neurobiological research sees these emotions, which are integrated in extended cognitive networks, and the bodily perceptions associated with them (somatosensory signals) as navigational aids within these cognitive networks (Damasio et al. 1991). Without the guidance of these emotional and somatosensory indicators, the search for appropriate behavioral options within the extensive network of potentially relevant experiences would be a tiresome, if not futile, endeavor (see the example below). The emotional responses encountered while scanning these extended associative networks help the system to focus its attention on promising behavioral options and to avoid risky ones. It can thus quickly decide which option to pursue.

Example

Patients with certain lesions to the brain have been observed to experience great difficulty in making apparently simple decisions (e.g., deciding whether to schedule their next doctor's appointment on a Tuesday or a Wednesday). Research has shown that the connection between areas of the brain important for representing signals from the body (somatosensory, postcentral areas) and areas of the brain important for self-representations (e.g., the right prefrontal cortex) is severed in these patients (Damasio et al. 1991).

Against this background, it seems quite reasonable to interpret motives as components of the self-system that serve to regulate behavior. Whenever a need is aroused, motives generate behavioral options that are embedded in cognitive-emotional representations of appropriate self-relevant experiences. These cognitive-emotional networks, which are postulated to form the functional basis of motives (McClelland, 1985b; Winter, 1996), are so extensive that they cannot possibly be conscious knowledge structures. Indeed, the pioneers of modern motivation psychology realized that it was not possible to measure motives by means of questionnaires, because these methods presuppose conscious knowledge about the subject of inquiry (McClelland et al., 1953). Today, implicit (unconscious) knowledge is measured by implicit memory tests, such as:

- Free reproduction ("Just tell me what you can remember of the things you've learned")
- Completing word fragments ("Which word can be formed by filling in the missing letters: COFF? ") and similar methods (Goschke, 1997b; Schacter, 1987; Tulving, 1985)
  - These diverse memory tests have one thing in common – participants do not produce memory contents following a direct cue (or "stimulus," as is the case in recognition tests, cued recall, or questionnaires) but spontaneously. In other words, the response is self-controlled rather than stimulus controlled.

The test that was developed to measure motives is based on a principle similar to that of implicit memory tests (see also the Excursus Box "The Measurement of Implicit Self-representations"), although it was originally embedded in a different theoretical context entirely. In the Thematic Apperception Test (TAT), participants are asked to write down a "free reproduction" of associations relating to images – in other words, to produce imagined stories based on a series of picture cues. Showing images is especially suitable for measuring motives because they are stored in a pictorial format. The hypothesis that motives exert an immediate, almost impulsive, effect on behavior is confirmed by findings showing that connecting goals with pictorial imaginations clearly increases the efficiency of motive-congruent action (Schultheiss & Brunstein, 1999; Storch & Krause, 2007).

Excursus

The Measurement of Implicit Self-Representations

On the basis of these theoretical and empirical arguments, the classical TAT would appear to be the ideal instrument for measuring implicit self-representations and specifically for measuring motives as holistic representations which are derived from need-relevant autobiographical experiences. However, the TAT has been criticized for failing to satisfy some of the quality criteria prescribed by classical test theory (Chap. 6). Indeed, the internal consistency and test-retest reliability (i.e., stability) of the TAT's motive scores leave much to be desired, and some studies have found that the instrument's potential to predict school grades is negligible (Entwisle, 1972). According to Winter (1996), however, the instrument's low test-retest reliability can be attributed to the simple fact that participants take the test instructions seriously and try to produce imaginative and original stories each time the instrument is administered. Hence, the consistency of results obtained from successive tests is low. When respondents are told that they can produce similar stories in the second test, test-retest reliability increases (Winter, 1996).

In psychometric terms, this means that test-retest reliability cannot be considered a fair measure of the TAT's quality. A similar argument applies to the instrument's low internal consistency, e.g., the low correlation of scores from two halves of the test, expressed in terms of Cronbach's α values. The assumptions of classical testing theory (e.g., that errors in the measurement of different items are uncorrelated) simply do not apply to motivational processes, which have a sequential dynamic that violates the principle of independence of subsequent measurements. Because needs become less intense when they have recently been satisfied, someone who has just written a story on the achievement motive is much less likely to produce another story dealing with that motive. The impact of the negative recency effect reported by researchers studying memory and attention may also play a significant role in this context. People telling stories tend to avoid repetitions, and the same holds for other cognitive processes.

We try to avoid repeating words in the same sentence, and both human respondents and laboratory animals avoid searching the same area twice when visually exploring a stimulus (Posner & Rothbart, 1992).

In view of the TAT's low reliability (Cronbach's α values approaching zero in many studies), classical test theory would not expect the test to show significant correlations with criteria relating to what it is supposed to measure (because reliability defines the upper limit of validity; Moosbrugger & Kelava, 2007). After all, why should a test that provides imprecise and unreliable measures have high validity? But if test-retest reliability and Cronbach's α values for internal consistency are indeed inadequate measures of the test's precision because the assumptions of classical test theory simply do not apply in this context, we can expect the validity of the TAT to be much higher than its reliability scores indicate. Research findings confirm the latter assumption: Meta-analyses show that the TAT has higher validity than questionnaire measures when it comes to assessing the three basic social motives (achievement, affiliation, and power) in self-initiated behavior, as opposed to behavior initiated by others (Spangler, 1992). When a measurement model that dispenses with some of the unrealistic assumptions of classical testing theory is applied (i.e., Rasch's stochastic model), the homogeneity and unidimensionality of the TAT is superior to that of many questionnaire measures (Kuhl, 1978; Tuerlinckx, De Boeck, & Lens, 2002). Notably, the Operant Motive Test (OMT) has significantly higher internal consistency and test-retest reliability than the TAT (Kuhl & Scheffer, 1999) and also meets the criteria of modern stochastic measurement models (Lang, Zettler, Ewen & Hülsheger, 2012). As explained below, the OMT combines measurement of motives with measurement of components of self-regulation.

Today, generating stories is considered to be closely related to functions of the self-system, which is after all based on abstraction from standard features of autobiographical episodes, that is, on "stories" experienced by the individual. The narration of stories thus activates precisely those mental functions that are involved in the representation of one's own "story." There is also empirical evidence to show that narrating one's own experiences in the form of stories ("narrative format") helps people to cope with stress and anxiety (Graci & Fivush, 2016; Pennebaker, 1993). Given the close connection between the self-system and the narrative format, the self-system might also be assumed to have stress-reducing functions. Indeed, empirical research shows that individuals with a highly developed, differentiated self-system (i.e., who see themselves as having comparatively many, distinct or both positive and negative "self-aspects") show significantly fewer depressive and physical symptoms under stress (Linville, 1987) and recover more rapidly from negative thoughts than do individuals with a less developed self (Showers & Kling, 1996).

13.2.3.3 Motives and Self-Regulation: The Operant Motive Test

The Operant Motive Test (OMT) was developed by Kuhl and Scheffer (1999) to preserve TAT features central to motive measurement (production of fantasy stories based on ambiguous picture cues) and to improve on those features with detrimental effects on measurement. Consequently, respondents are not required to write down their invented stories (which take a long time and, like the relating of dreams, can lead to distortion), meaning that more pictures can be shown (e.g., 15 for the OMT compared with six for the TAT: reliability of a test increases with the number of items). For the purposes of content analysis, it suffices for respondents to note down their spontaneous associations to the following questions, which are also used in the TAT (see overview).

Questions Used for Motive Measurement in the OMT and TAT

- What is important for the person in this situation and what is he or she doing?
- How does the person feel?
- Why does the person feel this way?

The OMT's coding system exploits the theoretical advances that resulted from incorporating self-regulatory processes within motivational theory (Heckhausen, 1989; Kuhl, 1981, 1983). Whereas classical motive measurement differentiates between an approach and an avoidance form of each motive only, the OMT distinguishes four different forms of approach motives (in addition to one avoidance component).

When scoring the OMT, the rater first decides whether any of the three basic motives (affiliation, achievement, and power and more recently also self-integration) are present and whether approach or avoidance motivation is expressed. In the case of approach motivation, the rater then assesses the degree to which either internal, self-regulatory processes (i.e., the "self") or external (situational) stimuli (incentives) are involved. These two "levels" of motive implementation are then evaluated for the presence of positive or negative affect (this affect is not necessarily consciously accessible to the respondent or mentioned explicitly in the associations).

New insights into personality functioning (Kuhl, 2000a, 2000b, 2001) have made it possible to formulate indirect indicators for unconscious affects that influence behavior (Table 13.1). Numerous findings confirm the assumption (second modulation assumption of PSI theory, see page 317) that negative affect impairs access to the self and to other forms of high-level, intuitive intelligence (e.g., the recognition of implicit coherence) and that coping with negative affect facilitates such access (Baumann & Kuhl, 2002, 2003; Kuhl & Kazén, 1994; Rotenberg, 1993). On the basis of these findings, the presence of negative affect can be deduced, even if it is not made explicit in respondents' associations, from a "narrowness" (i.e., neglect of wider context) or "rigidity" of motive implementation (e.g., if no creative or socially integrative form of need satisfaction can be identified: rigid implementation of the power motive according to the "all-or-nothing" principle; achievement motivation with a focus on competitiveness or "being better than others"; narrowing of the affiliation motive to a person offering protection rather than an intimate personal exchange). If, on the other hand, negative affect is expressed explicitly and creative solutions are sought, the self-regulated mode of coping with negative affect in implementing the motive in question is scored. In the case of positive affect, a parallel distinction is made between instances in which the self and its volitional mechanisms are involved in need satisfaction and instances in which there is no involvement of the self. Creativity and flexibility of implementation combined with a positive incentive "emanating" from the activity again indicate a variety of motive implementation that involves self-regulatory processes (intimacy for the affiliation motive, flow for the achievement motive, and prosocial, socially integrative influences on others for the power motive).

- The intrinsic motivation associated with these motive varieties is attributed to the largely unconscious effects of self-regulatory functions that help to maintain interest in and enjoyment of the activity even in the face of (intuitively solvable) difficulties (self-motivation).

Summary

The psychometric properties of the OMT confirm that the new instrument preserves central features of the TAT while making some useful improvements:

- Although the OMT takes less time to administer and score, and despite theoretical objections to the use of classical reliability measures, interrater agreement after a few days' practice is 0.85 (using Winter's formula, 1994). In the upper and lower quartiles of the distribution, Cronbach's α is over 0.70 (Scheffer, Kuhl, & Eichstaedt, 2003). Lower consistencies are theoretically plausible in the middle range of the distribution because motives (unlike cognitive abilities) compete

Table 13.1 The multilevel model and the motive components of the OMT

Columns define needs ("what")	Affiliation	Achievement	Power
Rows (levels) define mechanisms ("how")	Developmental hypothesis	Developmental hypothesis	Developmental hypothesis
	Low family cohesion ("high emotional distance," "low warmth")	Parental expectations of independence (i.e., exposure to difficulties)	Low paternal influence on the child ("eye level")
	Frustration of the need for closeness	Frustration of goal attainment	Frustration of the need for structure/hierarchy
Level 1	Aff1 intimacy	Ach1 flow	P1 guidance
Self and A+: self-access and depth	Warmth, love, joyful exchange	Being absorbed in a task, learning something	Influencing others: explaining, assisting, etc.
Level 2	Aff2 sociability	Ach2 standards of excellence	P2 recognition
Incentive objects and A+: extrinsic (OR)	Having fun together; entertainment	Doing something well, positive goals	Being the center of attention; status; recognition
Level 3	Aff3 networking	Ach3 coping with failure	P3 self-assertiveness
Self and A(−): active coping with problems	Identifying and actively overcoming problems within relationships	Identifying errors and problems and actively seeking a solution	Overcoming the resistance of others; making decisions
Level 4	Aff4 affiliation	Ach4 pressure to achieve	P4 dominance
Action and A−: active avoidance (planning, dogged perseverance (stimulus-free facilitation of IBC))	Seeking security; seeking closeness/affiliation	Persevering under stress; competing; being better than others	Noticing the negative aspects of power; one-sided control
Level 5	Aff5 dependence	Ach5 self-criticism	P5 subordination
Self-inhibition and A−: negative emotions and negative incentives become conscious; paralyzation	Experiencing loneliness and anxiety; feeling distance; asking for help; "clinging"	Acknowledging one's mistakes; becoming passive after failure; accepting help	Experiencing powerlessness; subordinating oneself; yielding to others

A(−) downregulated negative affect, *A*+ positive affect, *A*− negative affect, *IBC* intuitive behavior control, *OR* object recognition system

with each other. Hence, a motive can only be expected to have a consistent influence if its impact is relatively strong or weak. Therefore, motive research typically explores differences between persons in whom a different motives are dominant (correlations between motives and behavioral criteria are not quite compatible with the theoretical notion of competition among motives because the lack of reliable predictions within the middle range of motive strength violates some assumptions underlying statistical models).

- In terms of its validity, the OMT correlates with implicit measures of early childhood development, as outlined above, and with behavior ratings (Kuhl, 2001, pp. 604ff.; Scheffer, 2005). Moreover, the discrepancy between implicit motives as measured by the OMT and conscious goals predicts the development of psychological symptoms (as discussed later, see Fig. 13.5) and affects well-being (Kazén & Kuhl, 2011).
- Research has confirmed that the OMT is independent of questionnaire measures of motives (e.g., Scheffer, 2005; Wegner & Teubel, 2014).
- By contrast, the OMT converges with TAT measures but only when the arousal conditions specific to the motive under investigation are induced (Scheffer, 2000; Scheffer et al., 2003). This finding may indicate that the TAT is more dependent on the induction of arousal conditions

than the OMT. Given that the development of the TAT was closely associated with the situational arousal of specific motives, this assumption seems quite plausible.

13.3 Will Without Homunculus: Decomposing Global Concepts of Self-Regulation

Self-regulatory processes are not only involved in the satisfaction of needs and motives; they also come into play when goals that are not in line with what is currently the dominant motive or strongest need have to be implemented. The following sections are dedicated to the in-depth analysis of processes of self-regulation, independent of the degree to which they serve to satisfy needs, implicit motives or explicit goals in each individual case.

During the era of radical behaviorism, "self-regulation" and other designations for the concept of will were banned from experimental psychology as "unscientific," because it was assumed that they could not be measured on the basis of observational data. This same reasoning probably underlies contemporary attempts to deny the will an independent status and to portray volitional phenomena as "perceptual delusions" (Wegner & Wheatley, 1999; van Elk, Rutjens & van der Pligt, 2015). Indeed, it is inherently difficult to conceive of "will" as an object of observation for empirical science: Precisely those actions that are not caused by external (observable) stimuli but that originate from within the acting person himself or herself are deemed to be caused by will. Thus, the concept of will seems to describe a form of behavior whose causes cannot be observed. Worse still (for the scientifically working psychology), "self-caused actions" seem to be a form of behavior that does not obey the rules of cause and effect and thus eludes experimental analysis.

Today, the philosophical problems relating to the concept of will and freedom of will, in particular, can be resolved: Although the internal processes underlying volitional acts are more complex than behavior attributable to simple stimulus response bonds, this does not necessarily preclude the analysis of their causal conditions. "Freedom" of will does not mean freedom from causal determination but freedom from a certain form of causal determination, i.e., from determination by factors external to the self (Bieri, 2001; Kuhl, 1996; Pauen, 2004).

Examples of behaviors that are not determined by self-regulated processes include all forms of external control. These include instructions and obligations imposed by external sources (Deci & Ryan, 2000), as well as the compulsive performance of automatized behavioral routines and obsessive fixations on certain stimuli that occur in drug addiction and – in considerably milder form – in "extrinsic" motivation, i.e., when the motivation for performing an action does not reside "within the action" (or a corresponding need of the person performing it), but to attain a certain object from a goal that is not in tune with the self.

Habits and incentive-focused behavior are usually triggered by external stimuli, whereas self-determined acts of will are triggered by high-level internal systems, such as the implicit self-system mentioned above, which integrates a huge number of contextually relevant experiences, and the memory for explicit intentions, which might be compared to Freud's ego. Of course, the external and internal causes for a certain behavior may coincide (e.g., when children internalize their parents' expectations). This is not always the case, however.

Even if actions caused by the self or the ego are not seen as free from causal determination, the challenge remains of how to analyze the mechanisms by which these "internal" systems are assumed to trigger behavior. Explanations based on global concepts of will, such as will power, self-regulation, or self-efficacy (Bandura, 1998), are not really explanations at all – they merely attribute behavior to "will" or a similar summary construct which functions as a kind of inner puppet-master, a homunculus, the functioning of which remains unexplained.

- Global concepts of will are intuitively appealing because they can have enormous predictive power: If we know how people evaluate their own self-efficacy, we can make fairly

accurate predictions about their behavior and performance (Bandura, 1998; Barz et al. 2016). However, it is all too easy to forget that high *predictive* power, which radical behaviorism deemed to be so important, does not mean that a variable will have equally high *explanatory* power. The inclination of the gas pedal very well predicts the velocity of a car, but it says little about the car's systems and the functions that make the car move.

Global concepts of will are no better at explaining volitional phenomena than the high correlation between the inclination of my car's gas pedal and its velocity is able to explain how my car works. Only when the specific processes and functions underlying different volitional acts are identified can we expect to arrive at well-founded explanations of volitional phenomena.

The following section describes a functional design approach to "decomposing" global concepts of will.

13.3.1 Internal Dictatorship vs. Democracy: Self-Control and Self-Regulation

Even the very first step toward decomposing global concepts of will is a difficult one. How is it possible that our will is composed of many individual functions when in everyday life we experience our will as an entity? Everyday experience gives us the sense "that we do things, that we cause our acts, that we are agents" (Wegner & Wheatley, 1999, p. 480) – that our will is a single, undivided entity. How, then, can be it possible for the will to consist of a large number of functional components that we do not even experience consciously? The fact that more process components are involved in an act of will than we consciously know can be derived from wrong conscious explanations of acts of will: Many empirical findings suggest that the perception of an integrated will that determines our actions in everyday life may be erroneous. For example, research has shown that people sometimes think that they have chosen an activity themselves, when in fact it was imposed by others (Kuhl & Kazén, 1994), and EEG scans of study participants asked to decide for themselves when to make a certain hand movement (Libet, 1985) show that the impulse triggering the movement occurs a few 100 ms before participants actually decide to perform that movement (see Nisbett & Wilson, 1977, for further examples of false self-ascriptions of objectively externally triggered behavior). Against the background of such data, it is all too easy to conclude that there is no such thing as will and that the concept is not worthy of serious investigation (Wegner & Wheatley, 1999), rather than seeing it as one of the true determining sources of behavior or breaking it down into its functional components.

If we maintain that behavior may sometimes be influenced by the will, even if (as the authors assume) nonvolitional causes dominated in the experiments conducted by Wegner and Libet, another interesting possibility opens up: Could it be that volitional processes influence our behavior even if we have no conscious memory of their effects? If there is something to the effect of a higher-order function that coordinates our thinking, feeling, and acting such that it seems consistent, comprehensible, and coordinated to us and to others, then at least some of this coordinating activity must occur without us being consciously aware of it. Language-based consciousness, which is characterized by sequential processing, would be hopelessly overstretched if all factors impinging on complex decisions (which often have to be made within the space of a few seconds) had to be processed, not to mention the associated feelings and needs (one's own and other people's), not all of which can be consciously expressed in language or otherwise. It has thus been proposed that two modes of volition be distinguished:

1. Conscious, verbally expressible self-*control*, which operates sequentially and analytically
2. Self-*regulation*, which is largely unconscious and not verbally expressible, and which processes and coordinates information from the internal systems (e.g., feelings, beliefs, values, needs) and from the (social) environment largely simultaneously (in parallel) (Kuhl, 1996; Kuhl & Fuhrmann, 1998; Kuhl et al., 2015)

Experiments showing that words relating to a current intention inhibit the processing of words relating to a source of temptation without the respondent's conscious awareness (Fishbach, Friedman, & Kruglanski, 2003) confirm that unconscious processes are involved in shielding intentions against sources of temptation. Many studies show that the right ("unconscious") hemisphere is particularly strongly involved whenever self-referential judgments are made (Keenan, Nelson, O'Connor, & Pascual-Leone, 2001), especially when this occurs unconsciously (Kircher et al., 2002; Molnar-Szakacs, Uddin, & Iacoboni, 2005) and when self-relevant feelings are recognized in the faces of others (Pizzagalli, Regard, & Lehmann, 1999) or regulated (Levesque et al., 2003). According to Rotenberg (2004), the conscious (analytic) self-concept (the ego) and its self-control functions are closely connected to the analytic processing of the left hemisphere. In turn, the implicit (holistic) self, including self-regulation, seems to be more closely connected to the nonanalytic processing of the right hemisphere (cf. Kuhl, 1994b). Rotenberg (2004) calls the processing mechanism of the left hemisphere *monosemantic* because it reduces (polysemantic) context information to the one aspect that is most relevant for immediate action. The processing mechanism of the right hemisphere is called polysemantic because it implicitly and simultaneously considers several meanings of a word or a situation.

- There is now little doubt that conscious and unconscious self-representations (e.g., the conscious self or self-concept vs. the unconscious self-image) have different and independent effects on behavior (Greenwald & Banaji, 1995). Accordingly, an unconscious form of will can be assumed to exist alongside conscious will.

13.3.1.1 Self-Regulation

Summing up, we can describe self-regulation as a largely unconscious form of volition that involves, and yet goes beyond, the integrative intelligence of motives. Volitional self-regulation draws not only on those networks of experiences that are relevant for one's needs but on all autobiographical experiences that have contributed to the development of a coherent self-image. Metaphorically speaking, self-regulation is a kind of "internal democracy," within which many, at times contradictory, "voices" are heard (or votes are taken) – one's own feelings, attitudes, and values and those of others. These internal and external voices "vote" on matters of volition, resulting in a decision that is then implemented by the "government." Implementation may be facilitated by various measures, e.g., attempts to convince dissenting voices to support the goals adopted. The communication psychologist Schulz von Thun (2002) illustrates this integration of internal voices with the concept of an "inner team" consisting of many inner voices that receive guidance by a democratic "leader" who acts in an impartial, understanding, and integrative way. Under this guidance, a decision can be found that integrates all (or at least most) of the seemingly contradictory voices. The integration of all relevant experiences permits high levels of flexibility and creativity in behavior. In this respect, the concept of self-regulation is comparable with the concept of creative will (Rank, 1945) and with "resilient" forms of ego control (Block & Block, 1980) that prove extremely adaptable and flexible under pressure. The integration of one's own (implicit) motives is an example of self-regulation in terms of self-congruent action, which reconciles needs with societal demands (cultural norms) and the needs of others (altruism), instead of construing incompatible contradictions (like the analytical ego). If the "conscious" (analytical) self-concept is congruent with unconscious motives, well-being is increased, and the risk of forming psychosomatic symptoms is decreased. This holds for the need for achievement (Baumann, Kaschel, & Kuhl, 2005) as well as for other motives (Brunstein, Schultheiss, & Grässmann, 1998; Kazén & Kuhl, 2011; Schüler, Job, Fröhlich, & Brandstätter, 2008).

Excursus

Lateralization of Body Perception

The monosemantic processing of the left hemisphere seems to not only reduce the diversity of the holistic, parallel processing of the right hemisphere but also detach emotions and bodily perceptions from cognition (Kuhl et al., 2015). A vivid confirmation of this hypothesis is the study performed by Smeets and Kosslyn (2001) on 22 female patients suffering from anorexia nervosa. These authors presented real and distorted (i.e., thicker and thinner) pictures of the patients, as well as of female celebrities. Anorexic patients more often chose the thicker body shapes as correct but only if their own body (not those of the celebrities) was presented. In addition, this effect only occurred when the pictures were presented in the right visual half-field (i.e., with a processing advantage of the left hemisphere). This effect was independent of acute symptom formation (as measured by a clinical criterion for anorexia nervosa), but it was a function of the anorexic disposition (i.e., an incidence of anorexia nervosa in the patient's biography). These results suggest that distorted perceptions are not outcomes of anorexic symptoms but rather a dispositional risk factor for this disorder. The findings are consistent with the hypothesis that psychosomatic disorders are associated with a dissociation between analytical (monosemantic) and holistic (polysemantic) processing systems (Kuhl, 2011).

13.3.1.2 Self-Control

If the process of integrating "dissenting voices" does not work, then it may be time for the second form of volition, namely, self-control, to take over. Persistence in the self-regulatory mode in the face of a task that is necessary, but not at all pleasurable, would mean that we never get the job done, because "internal democracy lends its ear to the voices of protest."

Fujita et al. (2006) demonstrated that the self-controlled realization of goals is facilitated by the activation of analytical processing. The experimental activation of high-level cognitions, like analytical thinking about one's own motivation (and even abstract thinking in general), facilitated various aspects of self-controlled behavior. The interaction of self-control and the style of cognition (i.e., analytical thinking vs. holistic intuition) remained significant, even when the experimentally induced cognitions had no semantic reference to the content of the subsequent self-controlled behavior. In the experiments conducted by Fujita et al. (2006), high-level analytical processes were activated by asking participants to answer why-questions for each particular goal that they wrote down (e.g., "Why am I doing something for my health?"). Holistic experiences were activated by asking specific questions concerning the details of the implementation.

- The volitional mode of self-control operates in a very different way from self-regulation. The pursuit of goal attainment no longer involves trying to gather as many positive voices as possible in support of the goal. Instead, all voices that are not directly conducive to goal attainment are "switched to mute mode." At the psychological level, this "internal dictatorship" corresponds to the suppression of the self. The self is no longer the source, author, and agent of behavior but the object of controlling or even repressive measures preventing any potential distractions from interfering with goal implementation (Kuhl, 1996).

In motivational terms, this mode of volition includes cases of discrepancy between conscious goals and implicit motives, i.e., when goals that are incongruent with the dominant motive are "introjected." Given the obvious disadvantages of permanently suppressing "self-involvement" in the regulation of behavior, including the risk of psychological disorders (Baumann et al. 2005; Kuhl & Kaschel, 2004), it is easy to overlook the advantages of self-control: It is the classic mode of (potentially conscious) volition and permits many forms of adaptive behavior that are difficult

to realize in the more liberal volitional mode of self-regulation. There is empirical evidence for positive effects of self-control on goal attainment – particularly where unpleasant activities are concerned (Gollwitzer & Brandstätter, 1997; Fuhrmann & Kuhl, 1998) – and on readiness to engage in prosocial actions, especially when these require one's own preferences to be set aside (Finkel & Campbell, 2001).

It seems that negative affect is more conducive to self-control than positive affect (Kochanska, Coy, & Murray, 2001). In fact, a study by Kuhl and Fuhrmann (1998) found that individuals with a preference for the self-control mode show reduced self-regulatory efficiency (implementation of diet goals) when instructed to motivate themselves through positive affect, e.g., by rewarding themselves mentally for small steps forward rather than punishing themselves for mistakes and weaknesses (Fuhrmann & Kuhl, 1998). However, the fact that individuals with high (induced or dispositional) self-control achieve higher efficiency by motivating themselves through negative cognitions and emotions (e.g., by imagining the adverse consequences of not implementing an intention) does not mean that they do not experience positive affect once they achieve their goals. In fact, the opposite is true – respondents' satisfaction increases when experimentally induced self-control ("prevention focus") is combined with elements designed to distract attention from the task at hand (Freitas, Liberman, & Higgins, 2002).

Because the conscious form of will (i.e., self-control) is, by definition, more easily accessible to conscious thought, it is hardly surprising that the concept of will has, historically, almost always been reduced to this mode of volition.

Summary

Self-regulation is not inherently more satisfying or effective than self-control or vice versa. What is important is the fit between the dominant mood, the demands of the situation, and the induced or dispositionally preferred mode of self-control or self-regulation.

Self-regulation works better in the context of positive mood and situations emphasizing freedom of choice (Baumann & Kuhl, 2004; Deci & Ryan, 2000), whereas self-control works better in the context of negative mood, controlling instructions (Baumann & Kuhl, 2004; Fuhrmann & Kuhl, 1998), and situations requiring the suppression of distracters or sources of temptation (Freitas et al. 2002).

Self-regulatory functions (e.g., self-determination, attention control to promote goal implementation, and an action-oriented approach to coping with stress) have less impact when individuals experience high levels of social (normative) pressure than when they perceive less normative pressure (Marszal-Wisniewska, 2002; Orbell, 2003).

13.3.2 Progression vs. Regression under Stress: Volitional Inhibition and Inhibition of the Self-Access

The differentiation between the integrative and control modes of self-management is only part of the story. In everyday life, we often find ourselves in situations where both forms of volition are weakened: In stressful situations we are less capable of performing and have less "will power" than usual. This applies particularly to stressful situations in which it is easy to lose track of things. We may lose sight of what we wanted to achieve or have difficulty making decisions, and we may find it impossible to implement our intentions, even when the opportunity to do so arises (Kuhl, 2011; Kuhl & Kaschel, 2004). The latter phenomenon, in which performance of intended behavior is impeded, is termed volitional inhibition (impairment of self-control). The phenomenon of losing track of things in general, and of personal preferences in particular, is called self-inhibition (reduced self-access and impairment of self-regulation) because the information relevant to decision-making can no longer be accessed in the usual way (reduced self-access). It is important, however, to distinguish between two forms of stress at this point: Volitional inhibition is usually caused by pressure that weakens the positive affect required for behavior (e.g., a lot of unfinished work), whereas self-inhibition is more strongly

associated with threats that lessen the ability to remember personally relevant experiences (related to self; Kuhl, 2011). These two forms of stress-induced inhibition of the awareness and/or implementation of preferences and intentions correspond to Freud's concept of regression: The rational functioning typical of a healthy adult seems to be suspended by traumatic experiences and acute stressful episodes, such that the system "regresses" to simple ("infantile") processes. Pierre Janet proposed a much more elaborate take on the stress-induced inhibition of self-regulatory functions with his concept of psychasthenia ("psychic weakness"), which is currently experiencing a revival (Bühler & Heim, 2002; Hoffmann, 1998).

- In practical terms, the fact that volitional inhibition and self-inhibition are induced by pressure and threats, respectively, means that it is not sufficient simply to measure the efficiency of self-regulation and self-control. Rather, the degree to which these functions are available in stressful situations has to be measured separately. In factor-analytic studies, questionnaire scales measuring functional components of self-regulation (e.g., self-motivation, self-relaxation, decision-making competence, etc.) and self-control (e.g., impulse control, planning, etc.) are often orthogonally related to scales measuring self-regulatory competencies under stress (Kuhl & Fuhrmann, 1998).

13.3.2.1 Neurobiological Findings on Volitional Inhibition

The fact that the stress-induced inhibition of volitional and other high-level functions is driven by independent processes has also been demonstrated at the neurobiological level. The sensitivity of the hippocampus to stress seems to be a key factor here (Kanatsou et al., 2015; Sapolsky, 1992). At excessive stress levels, the hippocampus is inhibited, leaving its cognitive and emotional functions impaired:

- The cognitive functions of the hippocampus are implicated whenever numerous pieces of information from different sources have to be linked together (Sutherland & Rudy, 1989), e.g., in spatial orientation (Meaney, Aitken, van Berkel, Bhatnagar, & Sapolsky, 1988), in the memorization and recall of autobiographical episodes (Kirschbaum, Wolf, Wippich, & Hellhammer, 1996; Squire, 1992), and in the perception and recall of stimulus configurations (Metcalfe & Jacobs, 1998).
- The emotional functions of the hippocampus include its inhibiting influence on cortisol production (Sapolsky, 1992) and its mediation of the inhibiting influences of high-level cerebral processes on elemental (subcortical) processes, such as conditioned fear responses (Schmajuk & Buhusi, 1997). Thus, inhibition of the hippocampus might lead to situations in which fear responses cannot be inhibited, even in safe environments (e.g., fear of caged lions at the zoo).

These findings on the neurobiology of the integrative and affect-regulatory functions of the hippocampus (Kalisch et al., 2006; Metcalfe & Jacobs, 1998; Sapolsky, 1992; Schmajuk & Buhusi, 1997) establish a basic framework for psychological theorizing and offer explanations for many regression phenomena. Excessive stress primarily affects the "intelligent" functions and systems. Under stress, we are no longer able to deal with the normal amount of information, meaning that spatial orientation is reduced, that episodes experienced are "forgotten" (although the affects "conditioned" during those episodes are not), and that the broader context (including motives) is neglected. Instead, the focus is on details. For example, we may start to dislike someone for trivial reasons, "forgetting" the good times we have shared with them on account of a single disappointment.

Even experiences that remain accessible cannot influence elementary responses often acquired in early childhood (e.g., knowing that current relationships do not involve the same degree of threat as those experienced in childhood cannot neutralize traumatic early experiences). The discrepancy between motives and behavior, including its unconscious and conscious triggers (e.g., habits, goals, introjects), can thus be seen as a special case of stress-induced regression. When the influence of high-level systems is disabled under acute or chronic stress, people simply fail to

realize that their conscious goals and behavior are no longer in line with the structures that have evolved from their extensive experience of life (e.g., their motives and self). Analogous effects have also been documented in animals (O'Donell & Grace, 1995). This suggests that the mediation between high-level (cortical) and elementary systems (e.g., limbic system) through the stress-sensitive hippocampus developed early during phylogenesis.

In the stress-dependent regression mode the processing of extended experiential networks is evidently very dependent on the parallel mode of processing in the right hemisphere (Beeman et al., 1994; Rotenberg, 1993, 2004). Unlike the "analytic-verbal" left hemisphere, the right hemisphere is very much involved in the perception and regulation of somatosensory and emotional signals from the autonomic nervous system (Dawson & Schell, 1982; Wittling, 1990). We might therefore infer that motive discrepancies deriving from an overemphasis on goals represented analytically and verbally in the left hemisphere, and their isolation from motives and other implicit self-representations in the right hemisphere, might lead to impaired perception of and coping with emotional experiences, with corresponding effects on symptom development. Empirical data have recently confirmed this hypothesis (Baumann et al., 2005; Kehr, 2004a).

Findings on the hemispheric lateralization of self-congruent motives and explicit goals (including "introjects") have been applied to striking effect in recent experiments (Baumann, Kuhl, & Kazén, 2005) demonstrating that other-induced and self-chosen tasks are no longer confounded (i.e., self-infiltration is reduced) when study participants squeeze a rubber ball with their left hand for 3 min before they classify the tasks, a motor activity assumed to activate the right hemisphere. Activation of the right hemisphere seems to restore self-access. A recent study showed that the stress-dependent tendency to mistake assigned goals as self-chosen was reduced when the activation of a specific region in the right (medial) prefrontal cortex increased (Quirin, Kazén & Kuhl, 2009). Neurobiological studies have repeatedly shown that this region is activated during tasks requiring some holistic self-perception (Northoff & Panksepp, 2008).

13.4 Affect-Regulatory Competencies: Action vs. State Orientation

Investigation of volition and self-access and its potential neurobiological basis (e.g., stress-induced inhibition of the hippocampus) has shown that whether or not the self-regulatory competencies a person has developed remain available in stressful situations (i.e., under demand or threat) depends on that person's ability to regulate affect.

- Not only do affect-regulation competences provide important protection against unpleasant and disease-inducing affects, they also serve to ensure optimal communication among self-regulatory and cognitive systems.

13.4.1 The Core of the Construct: Self-Regulation of Affect

The construct of action vs. state orientation was introduced to further the study of individual differences in the regulation of affect (Kuhl, 1981, 1983). In contrast to classical personality dispositions such as extraversion and neuroticism, which focus on differences in sensitivity to positive vs. negative affect, i.e., the ease with which these affects develop (Gray, 1982; Gupta & Nagpal, 1978), state orientation describes the unwanted persevering of affect, i.e., the inability to terminate an unwanted affective state. It may entail unwanted rumination on an aversive experience (state orientation after failure: SOF) or a protracted state of indecision, hesitation, or lack of energy, all of which inhibit the implementation of intentions (prospective state orientation: SOP) (Kuhl, 1981; 1984).

Example

Action and state orientation are measured by items such as the following sample items from the Action Control Scale (ACS-90):

One of the items measuring prospective action orientation, which facilitates decision-making and implementation of intentions, reads:

- When I need to solve a difficult problem:
  (a) I get started at once.
  (b) I think about other things first before starting with the task at hand.

Response (a) is scored as action oriented (AOP) and response (b) as state oriented (SOP).

One of the items measuring the failure oriented, ruminative form of action orientation reads:

- When I am told that my work is completely unsatisfactory:
  (a) I feel paralyzed for quite some time.
  (b) I don't get discouraged for long.

Response (a) is scored as state oriented (SOF), response (b) as action oriented (AOF).

There is much empirical evidence for the reliability and validity of the scales (Diefendorff, Hall, Lord, & Strean, 2000; Kuhl, 1994a; Kuhl & Beckmann, 1994a). Although action/state orientation and extraversion/neuroticism share common features, as reflected in the theoretically expected correlations between the constructs, empirical research has also identified a number of differences. In contrast to extraversion and neuroticism, action orientation does not consistently predict mood at the beginning of an experiment; however, it does predict change in mood over the course of an experiment (Brunstein, 2001; Kuhl, 1998). These effects and other indicators of the positive influence of action orientation on self-regulation (e.g., compliance with a dietary regimen) persist even when controlling statistically for dispositional sensitivity to affects (e.g., neuroticism; Brunstein, 2001) or current mood (Palfai, 2002).

13.4.1.1 Counter-Regulation of Negative Affect: Action Orientation After Failure (AOF)

Research on learned helplessness (Hiroto & Seligman, 1975) established that exposing people to unsolvable problems leads them to display performance deficits in a subsequent task. These performance deficits were attributed to reduced expectations of success and to a subsequent decrease in motivation, as assumed in the theory of "learned helplessness" (Abramson, Seligman & Teasdale, 1978). An experimental test of the helplessness theory suggested a different explanation of the performance deficit observed after experimentally induced loss of control. According to this alternative model, exposure to loss of control in an initial task causes performance to drop in a subsequent completely different task only if the participants are not able to cope with the negative affect induced by the loss of control manipulation (Kuhl, 1981). According to this view, participants ruminate about the situation (e.g., the failure experienced) and are not able to focus on a new task. In contrast to the learned helplessness model (Seligman, 1975), reduced expectation of success observed after the loss of control experience at the first task was not generalized to the second task. Participants reported reduced expectation of success for the first task (in which they experienced failure), but they were not less confident before starting a second task (of another type), compared to a control group without failure experience. In other words, a generalized reduction in control expectations cannot be the cause of the performance deficits observed under failure conditions. How, then, was it possible to explain the finding that state-oriented participants exposed to loss of control (failure) on one task showed performance deficits on new and completely different tasks?

The questionnaire measure for failure-related action orientation, which was designed to measure individual differences in regulation of affect,

provided an explanation for these helplessness-related performance deficits. Only state-oriented individuals (SOF), whose questionnaire responses indicated that they had difficulty detaching from unpleasant situations and the thoughts associated with them, showed performance deficits. The helplessness phenomena were not replicated in action-oriented individuals (AOF), who showed no performance deficits after failure (Brunstein & Olbrich, 1985; Kuhl, 1981; Kuhl & Weiß, 1994). There was no question of a generalized decrease in expectations causing the performance deficits observed in state-oriented individuals, because they did not report reduced expectations of success after exposure to failure.

Further studies established that state-oriented rumination was in fact caused by deficits in affect regulation (Kuhl & Baumann, 2000). Analogous, though much more pronounced, deficits have been documented for state-oriented alcoholics (Stuchlikova & Man, 1999), who have a significantly worse prognosis when it comes to implementing the intention to steer clear of alcohol (Palfai, McNally, & Roy, 2002). Recent findings (Koole, 2004) confirm the hypothesis that uncontrollable rumination in SOF is caused by inhibition of the implicit self-system. SOF experience an increase in implicit activation of negative self-related cognitions, as measured by means of a priming method, when confronted with threatening thoughts (imagining a frightening person from their own biography).

- Given the many findings showing that the self provides a rather positive "bottom-line" evaluation of one's identity ("self-positivity"; Koole, 2000; Koole, Dijksterhuis & Knippenberg, 2001), the increase in negative evaluations observed in state-oriented individuals supports the hypothesis that self-access becomes inhibited as soon as these individuals are confronted with threatening situations. Given an intact self-access, state-oriented individuals would be able to take advantage of self-positivity, which would make it easier for them to cope with negative affect.

Most likely, AOF find it easier than SOF to detach from negative experiences because they check whether new information is potentially threatening and worthy of attention in the current context in a "preconscious" phase of information processing. This hypothesis was confirmed by an event-related potentials study in which respondents were presented with a list of words, some of which reminded them of painful life events. The results showed that *AOF respondents* paid *more* attention to *negative* than to neutral words after just 180 ms; SOF respondents did not even differentiate between negative and neutral words at that point (Rosahl, Tennigkeit, Kuhl, & Haschke, 1993). Maybe action-oriented participants are able to use this early (pre-attentional) sensitivity to threatening information to dampen (repress) negative affect in a very early stage of processing, provided the information is related to the current context. Once the irrelevant threat information has reached consciousness, attempts to suppress it take up vital processing capacity and are often unsuccessful: Instructing participants not to think of a white bear for a while can result in an excessive amount of thinking of white bears later on (Wegner, 1994).

13.4.1.2 Counter-Regulation of the Inhibition of Positive Affect: Prospective Action Orientation (AOP)

In contrast to the studies on learned helplessness, where (lack of) affect-regulatory competence was easily identified as the reason for performance deficits (questionnaire items referred directly to the inability to detach from negative feelings and thoughts), the affect-regulatory core of prospective action vs. state orientation (AOP) was not immediately apparent. Given that positive affect is known to facilitate behavior (Gray, 1982), however, it could be hypothesized that the hesitation in implementing intentions and the prolonged periods of deliberation reported by prospectively state-oriented individuals were attributable to a lack of behavior-facilitating positive affect.

Although positive affect is not addressed directly in the ACS-90, the experiment by Beckman and Kuhl (1984) described below provided indirect evidence for the assumed affective concomitants of the problems of decision-making and action implementation typically seen in state-oriented individuals.

Study

Regulation of Affect in State vs. Action-Oriented Individuals

Why is it that negative affect is conscious and directly accessible in questionnaires, whereas behavior-facilitating positive affect (or its inhibition) is not always directly accessible? Theoretical reasons for this difference in the measurement of negative and (inhibited) positive affect have been established, and it is now possible to explain why it makes sense to address negative affect directly in questionnaire measures and to measure positive affect indirectly in terms of its impact. Specifically, positive affect is more closely associated with the intuitive mode of information processing than with conscious, analytical processing (see the first modulation assumption of PSI theory below). It follows that consciously thinking about positive affect may in fact reduce that affect. The opposite is true of negative affect, which is intensified by conscious reflection because conscious reflection inhibits affect-reducing mechanisms, like the implicit mode of differentiated self-perception (Linville, 1987; Rothermund & Meiniger, 2004; Showers & Kling, 1996). An increasing number of studies show that coping with negative affect seems to be more efficient when implicit rather than explicit coping strategies are employed. The last part of this chapter will explain implicit coping processes on the basis of a functional analysis of the extension memory (EM) and the integrated self.

In one experiment, Beckmann and Kuhl (1984) asked respondents who were house hunting to assess the merits of various apartments and provided them with all the relevant information. Later on, when the respondents were asked to reassess the apartments, state-oriented respondents provided "objective" responses; because they had not been given any additional information, they made few, if any, changes to their previous assessments. Action-oriented participants, on the other hand, assessed the apartments they had favored at first measurement much more positively than the other apartments, even though there had been no change in the information provided. This mental "amplification" of incentives was interpreted as the result of a process of self-motivation, the aims of which were to bring the process of deliberation to a close and to support the implementation of the resulting decision (Beckmann & Kuhl, 1984).

Self-Motivation

PSI theory, as presented in Sect. 13.5, differentiates self-motivation from other ways of dealing with affect. In contrast to Freud's defense mechanisms and the corresponding coping styles (Folkman & Lazarus, 1988; Janke, Erdmann, & Kallus, 1985; Krohne, 1996), self-motivation (AOP – prospective action orientation) and self-relaxation (AOF – action orientation after failure) are attributed to the affect-regulatory impact of the implicit self (Koole & Coenen, 2007). The implicit self can be aroused through very brief exposure of self-relevant words. Its strength of activation can be measured by intuitive enhancement of positive evaluations of self-relevant items (e.g., the participant's initials: Koole, Dijksterhuis, & van Knippenberg, 2001). In contrast to defensive intensification of positive affect (e.g., embellishment of a sad experience), positive affect generated by self-motivation is not based on an impulsive reaction, such as repression of anxiety (e.g., through embellishment), which functions to protect individuals against experiences that would produce anxiety (Byrne, 1961; Krohne) but is the result of an informed – if largely unconscious – decision made by a system that takes all self-relevant information on the meaning of various affects into consideration before determining whether an affect is to be admitted or altered in the current context (self-confrontational coping). This form of affect regulation can also be applied to the regulation of negative affect (AOF). In lay terms, it is

coping by "looking at the problem instead of looking away." This mode of coping cannot be described in terms of the classical dichotomy of denial ("repression") and sensitization. In fact, it is an adaptive form of sensitization that combines tolerance of pain and anxiety (i.e., sensitization) with nondefensive, active coping.

It is difficult to provide empirical evidence for the implicit (unconscious) status of this form of affect regulation. It is even more difficult to demonstrate that the "self" – which PSI theory regards as the source of personal volition – is involved in this form of affect regulation in action-oriented individuals. Nevertheless, a Dutch team has provided empirical evidence for both assumptions with respect to the regulation of positive affect (Koole & Jostmann, 2004).

Koole and Jostmann (2004) were able to show the following:

- Prospectively action-oriented individuals (AOP) do indeed upregulate positive affect, even when that positive affect is measured at the implicit level (e.g., faster reaction times on a task requiring friendly faces to be picked out from a set of faces with negative expressions).
- The differences in reaction time on these tasks are so slight (in the range of milliseconds) that this upregulation cannot have been consciously controlled.
- The upregulation of positive affect is mediated by self-access, measured in terms of the speed with which self-referential questions are answered (e.g., "Does the following word describe you?").

The mediating role of self-access in action-oriented participants (AOP) is shown in Fig. 13.1. The significant association between the experimental induction of "demand or pressure" and the measure for implicit upregulation of positive affect (upper part of Fig. 13.1) decreases significantly when the assumed mediating variable (i.e., self-access) is entered in the regression model (lower part of Fig. 13.1). This pattern of results reveals the mediating status of self-access: When a relationship between two variables (e.g., drinking lots of beer and a hangover on the next morning) disappears after removing a third variable (e.g., drinking alcohol-free beer), this third variable must be the cause of the relationship.

If self-motivation is literally generated by the self-system, individuals with highly developed access to the self (high self-determination) should be able to motivate themselves better in everyday life and to tackle difficult goals successfully, without having to worry about being permanently discouraged. In fact, there is empirical evidence for the link between self-determination and self-motivation (Kuhl, 2001, p. 613; Lee, Sheldon, & Turban, 2003).

Dibbelt (1997) was able to show that the irresolute behavior of prospectively state-oriented individuals does not derive from a general lack of resolve but from their failure to muster behavior-facilitating energy from the self-system (see the study below).

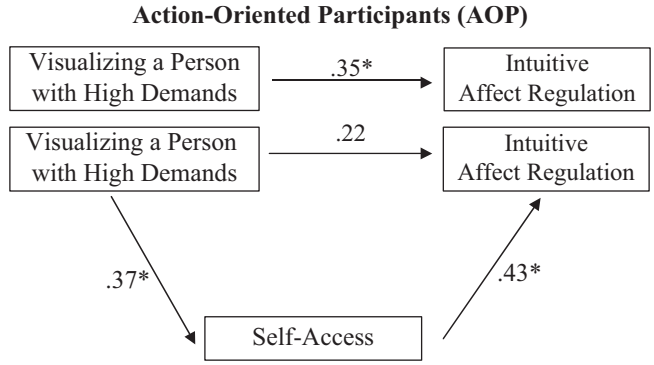

Fig. 13.1 In action-oriented individuals (AOP), the effect of visualizing a person with high demands on a measure of unconscious (intuitive) affect regulation is mediated by self-access, measured in terms of reaction times on self-referential judgments; this mediating effect is not observed in state-oriented individuals (Based on Koole & Jostmann, 2004)

Study

Self-Motivation in State and Action-Oriented Individuals

In Dibbelt's (1997) study, participants used the cursor keys to move a cursor from a starting point to a target point on a coordinate grid. As they approached the target point, a new target appeared on the screen. Participants were instructed to switch to the new target if it was closer than the original one and to keep aiming for the original target if the new one was further away. State-oriented participants did not show a general increase in reaction time when a change in direction was required. However, an increase in their reaction times was observed when the distances between the cursor and the two targets were equal (difference between the target distances is "zero" in Fig. 13.2). In this case, the participants themselves (i.e., their "selves") had to decide which target to aim for; there was no external cue indicating what to do (see Kuhl, 2001, p. 219). However, this increase in reaction time under the "self-determination condition" was observed only when an uncompleted intention was induced prior to the cursor task (e.g., "Could you remind me to save the data at the end of the experiment?"). These findings (Fig. 13.2) are fully congruent with the assumption that positive affect has to be generated before an intention can be implemented. The loading of "working memory" with a behavioral intention leads to inhibition of positive affect that state-oriented individuals are unable to counter-regulate (cf. Koole & Jostmann, 2004). This persevering inhibition has an impact on "self-willed" activities only (i.e., not externally controlled shifts of direction in the cursor task), because activities that need to be regulated by the self also require energy from the self (whose self-motivational ability is impaired in state-oriented individuals). In sum, the mediation analysis by Koole and Jostmann (2004) has shown that action-oriented individuals are able to reestablish positive affect when dealing with difficult "tasks" but that this ability disappears when differences in self-access are statistically removed.

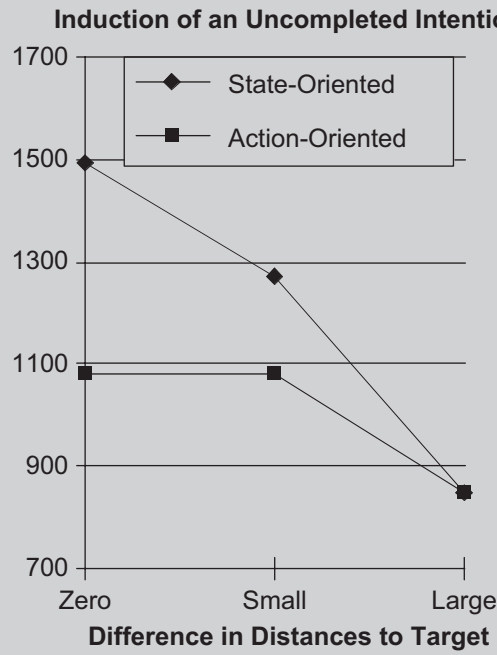

Fig. 13.2 Delayed reaction times in implementing a behavioral change in prospectively state-oriented individuals (SOP) after induction of an uncompleted intention (Based on Dibbelt, 1997)

13.4.2 Effects of Action and State Orientation

Like many other constructs in personality psychology, the constructs of action vs. state orientation have been validated by way of theoretically predicted and empirically obtained associations with numerous other variables. Research has confirmed that it was the right decision not to combine the two forms of action orientation (i.e., AOP and AOF) in a single scale, even though such an approach might seem quite reasonable given the significant correlations and the higher internal consistency of the combined scale (Kuhl, 1994a, 1994b). Today, the findings on this construct can be seen as an example of the feasibility and utility of a dissociation-oriented approach that foregoes the "simplifications" entailed when correlating variables that load on the same factor are aggregated and instead tests for any differences between the variables in terms of their relations to other variables (an approach that is often only possible within experimental designs).

The classical aggregation approach, which is usually based on factor analysis, neglects the dissociation-oriented exploration of relations with other variables whenever there is too strong a focus on the dichotomy between "convergent" and "discriminant" validity (Campbell & Fiske, 1959). The concept of convergent validity is based on the assumption that two correlating tests measure the same construct. However, two variables can be highly correlated without necessarily measuring the same underlying construct. This can easily be illustrated with the two variables body height and weight, which are highly correlated: Taller people are often heavier than smaller ones. Nonetheless, body height and weight refer to two distinct dimensions. This example illustrates a methodological challenge in psychology: How is it possible to ascertain whether two highly correlated variables measure two distinct dimensions? It can be assumed that the two correlating variables are related to different dimensions when they show diverging relationships to a third variable, under theoretically expected conditions.

The correlation between prospective and failure-related action orientation is usually significant, and in the range from $r = 0.30$ to 0.60 (Kuhl & Beckmann, 1994a), meaning that both variables sometimes load on the same factor (e.g., Kuhl & Goschke, 1994, p. 140). Nevertheless, a number of behavioral correlates are mostly replicable for AOP. Prospectively state-oriented participants (SOP) are hesitant to switch to subjectively more attractive activities in experimental situations (manifest alienation; Kuhl & Beckmann, 1994b) and seem to maintain uncompleted intentions in memory, even when there is no opportunity to implement them. This increased level of goal activation in state-oriented individuals can be inferred from their shorter reaction times on tasks that require words relating to previously formed intentions to be recognized (Goschke & Kuhl, 1993). Paradoxically, frequent thoughts about uncompleted intentions seem to inhibit implementation of those intentions:

- Prospective state orientation (SOP) correlates with delaying uncompleted intentions (procrastination: Beswick & Mann, 1994; Blunt & Pychyl, 1998; Fuhrmann & Kuhl, 1998; Kuhl & Fuhrmann, 1998; Kuhl & Goschke, 1994, p. 141).
- State-oriented individuals (SOP) take longer than action-oriented individuals to make a decision, especially when subjectively unimportant alternatives are available (Jungermann, Pfister & May, 1994; Stiensmeier-Pelster, 1994).
- They are less certain of their decisions (Stiensmeier-Pelster, 1994).
- They generate more complex decision-making contexts (Jungermann et al., 1994).
- Moreover, state-oriented individuals find it more difficult to reduce the number of options in the decision-making process (Niederberger, Engemann, & Radtke, 1987).

13.4.2.1 Effects of the Prospective Form of Action vs. State Orientation

One explanation for the nonimplementation of intended actions, which seems rather paradoxical given that uncompleted intentions are so strongly activated (Beswick & Mann, 1994; Blunt &

Pychyl, 1998; Goschke & Kuhl, 1994), is that the formulation of an intention (and its storage in "intention memory") actually inhibits executive functions in the first instance (see Sect. 13.5.2 on intuitive behavior control in PSI theory). Normally, this antagonism between intention formation and behavior control is useful in that it prevents premature implementation of actions. It makes sense for conscious intentions to be formulated whenever it is not yet possible or sensible to put them into practice (e.g., because difficulties have to be overcome or solutions found). When implementation of the intention is imminent (e.g., when the individual sees an opportunity to act), the antagonism between intention memory and behavior control must be overcome by generation of positive affect (Kuhl & Kazén, 1999).

- State-oriented individuals (SOP) find it much more difficult than action-oriented individuals to achieve this volitional facilitation (through self-motivation) (Beckmann & Kuhl, 1984; Koole & Jostmann, 2004). The finding that the interaction between frontal cortex and nucleus accumbens is inhibited in state-oriented individuals provides neurobiological evidence for this assumption (Herrmann, Baur, Brandstätter, Hänggi & Jäncke, 2014). This explains the paradox that state-oriented individuals put fewer of their implementations into practice (Kazén, Kaschel & Kuhl, 2008), even though (or rather: because) their uncompleted intentions are more strongly activated in intention memory (Goschke & Kuhl, 1993).

In fact, the study by Dibbelt (1997) outlined above demonstrates that state-oriented individuals only have difficulties implementing their intentions when they are required to load intention memory and the actions have to be initiated by the self, without external triggers. These findings suggest that impaired implementation of one's "own" intentions, i.e., intentions formed by the self-system (volitional inhibition), heightens sensitivity to external influences on one's behavior. Indeed, there are strong connections between the tendency to submit to the expectations of others (tendency to introjection and external control) and SOP (Kuhl & Fuhrmann, 1998).

According to the theoretical considerations outlined here, these phenomena should be more closely associated with the regulation of positive than of negative affect. Both the aggregation-based factor-analytic approach and the classic confounding of positive and negative affect as opposite poles of a common bipolar dimension (Russel & Carroll, 1999; Wundt, 1896) would lead us to expect that all of the findings are replicable with variables associated with negative affect (e.g., SOF). In the experiments cited, however, the findings of relationships with variables such as goal activation, procrastination, and overly complex and irresolute decision-making processes were not replicated for the failure-related form of state orientation (SOF).

13.4.2.2 Effects of the Failure-Related Form of Action vs. State Orientation

The behavioral correlates of the ruminative SOF differ from those identified above. Individuals characterized by SOF tend to engage in uncontrollable rumination that is at odds with their intentions (i.e., irrelevant to the task at hand; Kuhl & Baumann, 2000), to show higher inconsistency when judging their own preferences, and indifferent reaction times when deciding between alternatives of differing attractiveness (latent alienation: Guevara, 1994; Kuhl & Beckmann, 1994b). Moreover, as shown in Fig. 13.3, state-oriented individuals of the ruminative type often confuse their own wishes with those of others, particularly in the context of negative mood and unpleasant activities (self-infiltration: Kuhl & Kazén, 1994; in Fig. 13.3, "self-infiltration" is reflected in the number of false self-ascriptions of tasks imposed by another person minus the number of self-ascriptions in a baseline condition, i.e., on activities that were neither selected by the participant nor imposed by another person; see also the following study).

Here again, contrary to what the aggregation approach or a one-dimensional theory of positive and negative emotions would lead us to expect, the findings on the validity correlates of SOF

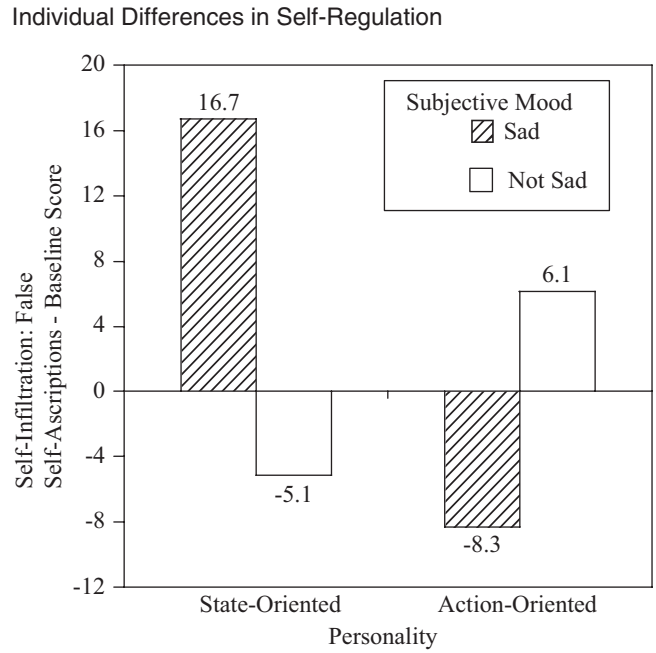

Fig. 13.3 Findings on self-infiltration: In the presence of sad mood, individuals characterized by failure-related state orientation (SOF) confuse their own wishes with those of others (Baumann & Kuhl, 2003)

could not be replicated for prospective state orientation in the studies cited. Again, the theoretical challenge was to explain the pattern of results obtained in terms of a simple functional mechanism. Why is it that uncontrollable rumination and self-ascription of others' wishes (self-infiltration) occur in the same people (those characterized by failure-related state orientation) under the same conditions? Is there a common mechanism behind rumination, self-infiltration, and alienation (e.g., inconsistent judgment of one's preferences)?

Study

Operationalization of the Self-Infiltration Effect

Self-infiltration is operationalized in terms of false self-ascriptions of other people's instructions or recommendations. In a simulation of a working day in an office, participants are invited to play the role of an office worker and to select activities they are willing to perform at the end of the experiment. The experimenter, who plays the part of their boss, then assigns a number of activities. Later on, an unexpected memory test is administered, and participants are instructed to classify each activity according to whether it was self-selected or not (i.e., assigned by the experimenter or not chosen at all). Findings show that state-oriented individuals (SOF) often erroneously recall tasks assigned by the experimenter as being self-selected. These individuals are evidently not always consciously aware of this form of internalized external control (misinformed introjection): The conscious self-concept (i.e., the ego) seems to be infiltrated by the wishes and expectations of others. State-oriented self-infiltration is most likely to occur in association with negative affect (Fig. 13.3); e.g., when the activities to be performed are unattractive or when negative mood is induced (Baumann & Kuhl, 2003; Kazén, Baumann, & Kuhl, 2003). These studies have also produced findings indicating that the rumination on unwanted (i.e., task-irrelevant) matters that is characteristic of state orientation is significantly correlated with self-infiltration.

Interestingly, these correlations can be explained by one common mechanism: The behavior observed in those state-oriented individuals with a propensity to rumination can be explained by inhibited self-access in the presence of negative affect. Uncontrollable rumination occurs when self-access is inhibited because, without this access, the system literally does not know what it wants. Without at least an implicitly activated representation of what is wanted (e.g., of activities appropriate to the task at hand or the current self-representation), it is impossible to identify unwanted thoughts and feelings, let alone to filter them out and neutralize them. Inhibited self-access also explains why these individuals confuse their own wishes with those of others (self-infiltration) and why they show inconsistencies when asked to state their preferences (alienation): Without self-access, one cannot decide whether a wish or a goal has been generated by the self (i.e., is self-determined) nor can one produce consistent judgments of one's own preferences on consecutive occasions. Without self-access, it is difficult to evaluate whether or not some goal or action is self-chosen. Self-access is also necessary to be able to feel consistent preferences at different points in time.

13.4.2.3 Neurobiological Foundations of the Relationship Between Self-Perception and Regulation of Affect

The right hemisphere (especially its prefrontal area):

- Facilitates self-representations, as measured by implicitly self-referential questions ("Does the following word describe you?"; Craik et al., 1999; Molnar-Szakacs, Uddin & Iacobini, 2005) or the recognition of one's own face (Keenan et al., 2001) or endorsement of self-descriptive words (Kircher et al., 2002)

- Supports withdrawal-oriented reactions of the "autonomic" nervous system (Harmon-Jones & Gable, 2017), which are considerably weaker when emotional information is processed in the left hemisphere, (Dawson & Schell, 1982; Wheeler et al. 1997; Wittling, 1990)

- Is directly involved in the downregulation of negative affect (the right hemisphere is activated more strongly than the left hemisphere when study participants successfully downregulate negative affect; Levesque et al., 2003)

  – Taking all these functions together (Kuhl et al., 2015), we can now explain from a functional design perspective why state orientation (SOF) increases the risk of psychological symptoms (Baumann et al. 2005; Hautzinger, 1994; Kuhl, Kazén & Koole, 2006), whereas failure-related action orientation not only protects against stress-induced symptoms but helps to maintain occupational performance (Diefendorff et al., 2000; Kuhl et al., 2006).

Figure 13.4 reports findings from a mediation analysis carried out in a large sample of patients with various psychological symptoms (e.g., depression, anxiety, eating disorders). The significant protection (reflected in a negative regression coefficient) that the interaction between failure-related action orientation and everyday stress (AOF × stress) afforded against aggravation of symptoms (−0.31*) decreased significantly (to −0.23) when motive discrepancies were included in the regression model. In other words, AOF prevents aggravation of symptoms by suspending the effects of motive discrepancies (e.g., the pursuit of introjects or consciously represented achievement goals that are not supported by a corresponding motive and associated needs). AOP did not have this kind of protective function. It did, however, help to predict overall well-being (in contrast to AOF).

Other studies show that the stress-resistant self-access of action-oriented individuals can be operationalized by an objective index called autonoetic interference. In self-infiltration experiments, action-oriented participants show increased reaction times when presented with a list of the unattractive activities they chose themselves (e.g., when they were induced to choose among unattractive activities; Kazén et al. 2003). SOP fail to notice the contradiction between these two incompatible pieces of information from the self-system (i.e., it is an unattractive activity and that they chose it themselves).

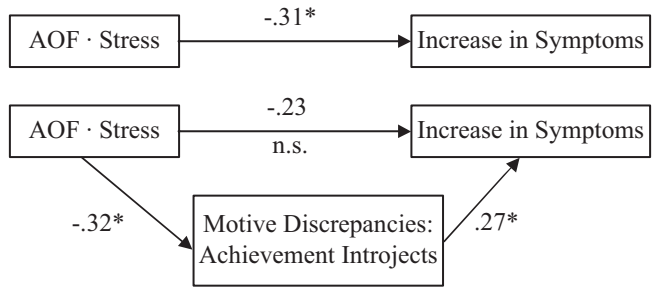

Fig. 13.4 Action orientation after failure protects patients with high levels of everyday stress (AOF × stress) against aggravation of symptoms (increase in symptoms from first to second point of measurement). Motive discrepancies mediate the relationship between AOF × stress and aggravation of symptoms (Based on Baumann et al. 2005)

Because state-oriented individuals are unable to downregulate negative affect, access to the self is inhibited, which explains why they do not show increased reaction times when recalling facts that should, in fact, give them pause for thought (i.e., the fact of having chosen an unattractive activity) when asked to state which of the activities on a list they chose themselves.

13.5 PSI Theory: Affect-Modulated Interactions of Personality Systems

Research findings on stress-induced regression – in terms of inhibition of volition (impaired implementation of intentions) and impaired self-access (e.g., neglect of motives in the formulation of goals) – draw attention to the influence of emotion on the efficiency of high-level ("intelligent") psychological systems:

- Excessive stress and the associated negative affect inhibit high-level holistic processing (self-access), whereas positive affect plays a key role in facilitating behavior.

However, it is difficult to integrate these findings into theories of motivation, which (like personality theories in general) tend not to offer elaborate architectures of psychological functions or processing systems.

Among classic theories of personality, the only exception is Jung's personality theory, which differentiates between two antagonistic modes of processing: analytical thinking and holistic feeling, on the one hand, and intuiting and sensing, on the other. Jung's cognitive typology differs from traditional affective typologies (Hippocrates, Galen), the basic concepts of which continue to play a dominant role in personality psychology and are now supported by the findings of factor analysis (Eysenck, 1990; McCrae & Costa, 1987). However, precisely because he intended to contrast his typology with affective typologies, Jung disregarded the modulatory influence of affect on styles of cognitive processing. Another reason why Jung's four cognitive functions cannot serve as basis for an architecture of the mind in motivation psychology is that – as he noted self-critically in his main typological work (Jung, 1936/1990) – he did not elaborate theoretical concepts of motivation or behavior. Similar limitations apply to modern, empirically grounded approaches that aim to revive holistic and analytical forms of information processing in personality psychology (Epstein, Pacini, Denes-Raj, & Heier, 1996; Strack & Deutsch, 2004).

PSI theory describes the functional characteristics of four psychological systems, which are of particular importance for action control (e.g., the functional characteristics of the intention memory). In contrast to a dualistic differentiation between analytical and holistic processing, PSI theory distinguishes two analytical and two holistic systems. Therefore, intuitive processing is not limited to impulsive behavior (Epstein et al., 1996; Strack & Deutsch, 2004): Apart from the

elementary form of intuition, which facilitates spontaneous behavior, a high-level form of intuition is postulated (i.e., the self), perhaps most important function of which is related to the development of integrated self-representations.

13.5.1 Psychological Macrosystems

The theory of Personality Systems Interactions (PSI theory) seeks to close the gap in motivation theory in terms of functional design. It is based on the assumption that the functions and systems postulated in the various approaches (e.g., Anderson, 1983; Jung, 1936) offered by cognitive or personality psychology (e.g., Jung's main functions of personality; short-term vs. long-term memory; executive functions such as the central, attention-based monitoring system: Norman & Shallice, 1986) do not suffice to answer the questions raised in the preceding paragraphs. Motivation psychology is concerned with the development of need- and behavior-relevant aspects of personal experience, which are expressed in motives and other components of an implicit self-system. It examines the degree to which concrete goals and actions correspond with these motives (self-congruence) and whether or not goals and intentions are implemented in behavior ("volitional facilitation").

- According to PSI theory, *volitional facilitation* is dependent on the interaction of an *intuitive behavior control* system (IBC) and a system that is responsible for maintaining difficult intentions (i.e., intentions that cannot or should not be implemented immediately) in memory so that they are not "forgotten" or displaced by competing action tendencies. The main differences between this *intention memory* (IM) and the construct of short-term or working memory in cognitive psychology (Baddeley, 1986) are that the IM stores action related rather than sensory information and has an inhibitory component that serves to prevent premature implementation of intended actions (Kuhl & Kazén, 1999).

It is possible to measure the activation of an intended action in IM: Words relating to uncompleted intentions are recognized faster than neutral words (Goschke & Kuhl, 1993). In recent years, various other methods have been developed to operationalize the persistent activation of intentions (Förster & Liberman, 2002; Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999; Shah, Friedman, & Kruglanski, 2002). Activation of intuitive behavior control can be experimentally induced by asking respondents to imagine where, when, and how they will implement their intentions (Armor & Taylor, 2003; Gollwitzer, 1999; Svenson, Oestergren, Merlo, & Rastam, 2002; Wieber, Thürmer & Gollwitzer, 2015). Findings show that the implementation of intentions is fostered by the induction of "implementation imagery." IBC dominates social interaction from birth (Meltzoff & Moore, 1994; Papoušek & Papoušek, 1987) into adulthood (Chartrand & Bargh, 1999).

Self-development (including development of motives) and the self-access on which it depends are assumed to be dependent on the interaction of an object recognition (OR) system and a high-level self-system. The self-system is so extensive that it requires a parallel memory system capable of integrating an enormous number of experiences (Kuhl et al., 2015). This extension memory (EM) is in turn so extensive that it can only be "felt" implicitly and is not fully accessible to conscious awareness (and might thus be seen as approximating "feeling" in Jung's typology). With its parallel network structure at a high level of integration, extension memory is suitable for representing persons, probably the most complex of the challenges facing the four macrosystems. One of these persons is the self, which is represented by numerous references to both internal processes (e.g., needs, feelings, values, identity), and other people (Andersen & Chen, 2002).

The OR system supplies the input required for the development of EM and the motives and other self-aspects stored in it. The "objects" in question are not only items that can be perceived visually but all products of processing that can be extracted from their contexts as single units and

thus recognized and labeled in other contexts. Hence, feelings can be represented as objects, if they are disconnected from the eliciting context and the many subtle cognitive and emotional overtones associated with it.

Definition
Emotions are defined as implicit representations that integrate a large number of both affective and cognitive contents (Ortony, Clore & Collins, 1988), including the relevant contextual information, and that are typically processed at the level of extension memory. An emotion can thus be seen as the experience-centered analogue of a motive, with behavior-relevant representations being more elaborated in the latter.

13.5.2 The First Modulation Assumption: Volitional Facilitation

Affects are subcognitive components of emotions. In neurobiological terms, they are generated on a subcortical level, and may be – but are not necessarily – linked to cognitive elaborations (LeDoux, 1995). In other words, we need to get used to applying terms like "affect" even when the person concerned is unaware of it: Like emotions affects are not always consciously accessible (Quirin et al., 2009). The latter are generated by changes in the discrepancy between actual and desired states on the level of needs (McClelland et al., 1953), which, as defined at the beginning of the chapter, are subcognitive and subaffective detectors of such discrepancies. To date, however, psychological literature has largely overlooked this important connection between affects and their motivational basis. It implies that each affect is directly or indirectly driven by a "vicissitude," i.e., a need episode with a positive or a negative outcome. Analogous ideas on the origins of affect have been proposed for attainment of vs. disengagement from personal goals: Coming closer to achieve a goal generates positive affect, whereas thwarted attempts to reach a goal generate negative affect (Carver, Lawrence, & Scheier, 1996; Martin & Tesser, 1996). This approach needs to be expanded from a motivational perspective because it does not incorporate subcognitive sources of affects. The term *goal* does not describe subcognitive needs but cognitive representations of aspired situations or objects.

The goal- and need-driven basis of affects offers a plausible explanation for the role they are attributed in PSI theory: Affects establish that configuration of psychological systems that is most conducive to satisfying a current need or to implementing the respective motive or goal.

Thus, the ability to tolerate phases of inhibited positive affect [A(+)], which necessarily occur in the context of difficult tasks, is postulated to be an integral component of the achievement motive. This "frustration tolerance" can be traced back to the conditions under which the achievement motive develops, as outlined above. In a parenting climate supportive of the child's independence, parents do not always intervene when the child runs into difficulties or experiences frustration [A(+)]. Instead, they allow inhibited positive affect to occur, though not to an excessive degree (Heinz Heckhausen's principle of motivational fit).

- The first modulation assumption concerns the functional effects of frustration:
  - The inhibition of positive affect activates intention memory, including its inhibitory component (inhibition of IBC).
  - Release of this inhibition – e.g., when a problem is solved or when an individual is given encouragement or motivates himself or herself – reestablishes the connection between intention memory (IM) and intuitive behavior control (IBC). As a result, IBC "learns" which behavioral routines are "wanted" at the level of IM (Fig. 13.5).

Positive affect therefore not only has the function of facilitating intuitive behavior, it can also facilitate volition in the presence of higher-level will. In functional design terms, this occurs when intention memory is loaded with a behavioral intention. The volitional facilitation that occurs in the presence of positive affect permits intuitive behavior control (IBC) to implement conscious intentions more rapidly and accurately,

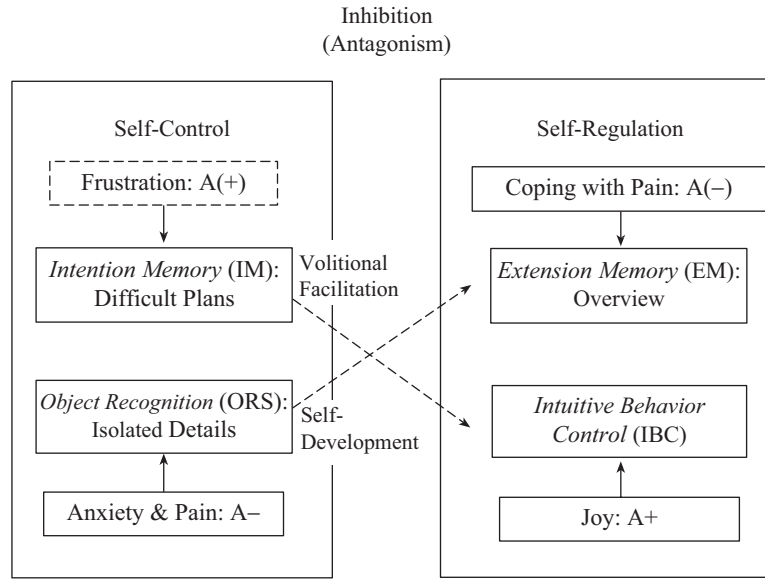

Fig. 13.5 Schematic illustration of PSI Theory (Kuhl, 2001; see text for details)

Study

Volitional Facilitation Effect

Experiments demonstrating that Stroop interference is reduced or completely eliminated when participants are shown positive words such as "success" or "good luck" before presentation of the Stroop stimulus (i.e., color name words printed in nonmatching colors; Kuhl & Kazén, 1999) support the volitional facilitation assumption. According to the first modulation assumption, when intention memory is loaded with the difficult part of the task ("name the color instead of reading the color word"), the positive affect triggered by positive primes serves to connect the task with intuitive behavior control, such that the delay in reaction times typically observed for incongruent color words no longer occurs. In the experiment described above, we tried to increase the probability of participants activating the instruction in IM prior to each trial (not necessarily consciously) by having them work on two Stroop tasks per trial, each introduced by a positive, a negative, or a neutral word. We assumed that maintenance of an intention in IM becomes necessary whenever a sequence of more than one action step is to be performed (the next step has to be kept active in memory in order for the sequence to be performed smoothly).

These results cannot be explained by the impulsive form of the holistic processing (i.e., intuitive action control): If positive primes had facilitated impulsive action control (i.e., the dominant behavioral tendency in the intuitive behavior system), then Stroop interference should have been increased rather than reduced. The first modulation assumption provides an explanation for the paradox that performance on the easy task (i.e., naming the color in which a row of Xs is printed) did not improve in trials with a positive prime but that the difficult task (i.e., naming the incongruent ink color in which a color name word was printed, e.g., responding with "blue" when the word "red" was printed in blue ink) was performed faster when a positive word was presented before the Stroop stimulus. When intention memory is loaded, positive affect does not facilitate simple ("dominant") behavioral routines; rather, it facilitates responses that are difficult but required and intended.

because the release of volitional inhibition reestablishes the connection between IBC and intention memory. The IBC can thus "learn" which of the behavioral routines stored within it correspond with the current intention.

From a neurobiological perspective (Kuhl, 2001, p. 681ff.), this connection is assumed to be established during affective change from A(+) to A+, when activation of the left hemisphere (IM) caused by A(+) gives way to activation of the right hemisphere (EM) caused by A+. Communication between hemispheres is presumably impaired as long as one of the two affective states dominates. Affective change is of critical importance for the interaction between psychological systems, because it is only during affective change that there is a short "window of opportunity," during which both hemispheres are activated to roughly the same degree and are thus able to exchange the information activated to the best possible effect.

Further studies have confirmed that the effect of volitional facilitation is particularly typical of achievement motivation. A reduction in Stroop interference was found after priming with positive achievement-related words (e.g., "success" or "increase in performance"), but not after priming with words alluding to positive affiliative experiences (e.g., "first love" or "being happy together"; Kazén & Kuhl, 2005). This finding confirms the assumption that affects, together with the currently dominant need, establish the configuration of psychological systems that is most conducive to satisfying that need. In the case of achievement behavior, this systems configuration is characterized by a shift from IM to intuitive behavior control. When achievement motivation is aroused, activation of intention memory helps to maintain self-commitment to a difficult task and perseverance until it is completed. Indeed, experimental studies have shown that activation of goal-related information (e.g., by means of experimentally induced priming) can increase perseverance (Shah & Kruglanski, 2003). Volitional facilitation by means of affective change is also crucial, however. In its absence, difficult achievement goals would be maintained for a long time, but concrete efforts to achieve them would be rare ("passive goal fixation").

Beyond the microanalytical level and the Stroop experiments outlined, experimental evidence for volitional facilitation has also been found on the more everyday macroanalytical level. In numerous experiments, Oettingen and colleagues confirmed that successive contrasting of positive aspects of the desired future (goal attainment) and negative aspects of present reality (difficulties still to be overcome) facilitated implementation of realistic intentions, whereas a focus on just one of these aspects reduced efficiency of implementation (Oettingen, 1997; Oettingen, Pak, & Schnetter, 2001).

Higgins's (1987) findings, according to which inhibited positive affect (e.g., "dejected emotions") is closely associated with a focus on unattained, partly unrealistic ideals – i.e., with discrepancies between the "ideal self" and the "actual self" – can also be explained on the basis of the first modulation assumption. Unrealistic ideals may lead to intention memory being constantly loaded with intentions, without the steps needed to realize those ideals ever being taken. According to the first modulation assumption, fixation on dejected emotions or other forms of the inhibition of positive affect impedes the implementation of the corresponding behavioral intentions (through activation of IBC).

13.5.3 The Second Modulation Assumption: Self-Access and Self-Development

PSI theory also assumes the interaction between the systems relevant to self-development to be modulated by shifts between contrasting affective states. As mentioned above, self-development presupposes that individual new experiences are constantly integrated into the growing network of personal experiences (i.e., into the self-system as part of extension memory). According to the second modulation assumption, this process is facilitated by the shift between negative affect (A−), which occurs after painful experiences or experiences that do not fit existing schemata (of EM), and the subsequent downregulation of this negative affect [A(−)] (Fig. 13.5). This shift forms the basis of self-development: It occurs after painful experiences or experiences that cannot easily

be assimilated by existing schemas (of EM) are at first tolerated (instead of repressed) and then slowly integrated into the self, a process that is called self-confrontational coping.

- The second modulation assumption states that:
  - Negative affect intensifies isolated experiences that are abstracted from their contexts (i.e., "objects" from the OR).
  - Negative affect inhibits access to integrated self-representations, motives, and other contents of extension memory.
  - Downregulation of negative affect (that involves self-confrontation) reestablishes access to extension memory.

According to the neurobiological model describing this process (Kuhl et al., 2015) affective change opens a time window during which both hemispheres are activated to approximately the same medium degree and are thus able to exchange information to the best possible effect (e.g., to integrate left-hemispheric isolated experiences or "objects" into right-hemispheric extended self-referential networks: self-development).

For self-development to occur, it is thus necessary to overcome the antagonism between the perception and acknowledgement of individual experiences (i.e., "objects" that are extracted from their contexts) and the extension memory, which unites a huge number of these experiences within integrated "experiential landscapes." Figure 13.5 illustrates the modulating influences of different affects on systems activation and shows that it is possible to overcome the antagonism between the systems by means of shifts in affect ("emotional dialectic"). For example, rather than a painful experience being suppressed, it is first perceived as an isolated experience ("object") and later integrated into the self (part of the extension memory), a process that requires tolerance of pain (A−) followed by the ability to cope with that pain [A(−)]. This integration increases the chances of three distinct processes: the compensation of painful or fear-inducing experiences due to contact with new experiences (either personal or from others); the detection of new solutions and behavioral possibilities in large networks of experiences; and coming to terms with the pain, thanks to meaningful connections with personal (or collective) values, needs, or other parts of self.

Uncontrollable rumination (Kuhl, 1981; Martin & Tesser, 1989; Nolen-Hoeksema, Parker, & Larsen, 1994) can be attributed to the inhibition of self-access owing to persevering negative affect. Without self-access (e.g., in the presence of excessive negative affect that cannot be downregulated), the system no longer "knows" which cognitions are wanted at a certain time and which are not. Moreover, it is not possible to apply high-level filters that admit only wanted thoughts and feelings. A possible neurobiological basis for these relationships was discussed above: the sensitivity of the hippocampus to stress (Sect. 13.3.2). Animal experiments have shown that inhibition of the hippocampus in the presence of excessive stress inhibits the connectivity between high-level processes (e.g., in humans' implicit representations in EM, such as "I want to concentrate on the task") and low-level processes, such as (inhibition of) distracting thoughts or feelings. On a rudimentary level, these functions of the hippocampus can also be found in infrahuman mammals (Schmajuk & Buhusi, 1997).

The phenomenon of self-infiltration can also be attributed to the inhibition of self-access under conditions of persevering negative affect.

Definition
Self-infiltration means confusing one's own wishes and choices with those of others.

As mentioned before, persevering negative affect leads people to recall tasks that were assigned or recommended by others as being self-selected (Baumann & Kuhl, 2003; Kazén et al. 2003; Kuhl & Kazén, 1994). What is more, functions of extension memory that do not relate to the implicit self (but to extension memory itself) are also adversely affected by negative affect. Performance on coherence tasks ("Do the three words goat, pass, and green have anything in common?") is a good example of this phenomenon – the correct answer (in this example, yes) can often be given intuitively even without finding an explicit reason (here, mountain) (Baumann & Kuhl, 2002; Bolte, Goschke, & Kuhl, 2003).

Intuitive coherence judgments are assumed to be a function of extension memory because they require access to remote semantic networks, such that connections between distantly associated words can be "sensed" implicitly if they cannot be explicated directly. Summation priming, which seems to be facilitated more by right than by left-hemispheric processes (Beeman et al., 1994), represents a similar operationalization of intuitive inferences requiring access to wide semantic networks.

13.6 Development: Determinants of Action and State Orientation

Is it possible to overcome adverse effects of state orientation? Can the stress-induced inhibition of self-perception and the related self-regulatory functions be surmounted? Given the significance of the ability to bring about changes in affective states by means of self-regulation, thus activating the psychological system required at a given point in time, potential points of intervention for the training or therapy of affect regulation must be of considerable interest. This raises the question as to the conditions under which the ability to self-regulate affect develops. In the context of PSI theory, this developmental process is described by the systems conditioning model. Its premise is a simple one. If the self is no longer regarded as a phenomenological metaphor, but as a real system with a functional profile that is open to experimental investigation, then "self"-regulation of affect means that the self-system has to establish connections with the systems that regulate affects. In neurobiological terms, these might be connections between subcortical affect-generating systems (LeDoux, 1995) and the right prefrontal cortex, which is activated when participants make implicit self-referential judgments (Craik et al., 1999; Keenan et al., 2001) or try to regulate emotions (Beauregard, Levesque, & Bourgouin, 2001).

How does the brain learn to establish new connections? The best known way is classical conditioning: two stimuli (e.g., the ringing of a bell and the food that triggered salivation in Pavlov's dogs) become linked when they occur sequentially within a certain space of time (contiguity or contingence). Once this connection – for which there has long been neurobiological evidence (LeDoux, 1995; Schmajuk & Buhusi, 1997) – has been established, the conditioned stimulus (e.g., the ringing of the bell) triggers a conditioned response (here, the secretion of saliva).

- According to the systems conditioning model, the reinforcement of connections between systems is analogous to classical conditioning. For the self-system to be connected to affect-regulating processes, such that the individual is later able to regulate emotions "himself or herself" (i.e., without external help), activation of the self-system must coincide with activation of affect-regulating processes sufficiently frequently in the course of development.

Of course, until affect regulation can be achieved by means of self-regulation, external support is required. For example, a child experiencing negative affect relies on the reassurance or consolation of an attachment figure, and a child experiencing loss of positive affect (e.g., when faced with a difficult task or an experience of loss) needs encouragement. But how can an interaction partner (e.g., father, mother, teacher, partner, therapist) know when a person's self-system is activated and provide the necessary reassurance or encouragement within the appropriate time frame? According to the systems conditioning model, the self is active whenever needs or related feelings are expressed (indeed, one of the primary functions of the self-system is to express feelings and needs). Thus, the attachment figure needs only to listen out for such references. This attentional focus on personal information is called responsiveness or "mind-mindedness" in developmental psychology (Meins, 1999) and "mirroring" in the neo-analytical literature (Kohut, 1979). The more differentiated the self becomes throughout its development, the more "exacting" it will be with respect to the feedback expected: at later stages in development, the individual needs to feel understood on a personal level for himself or herself to remain active. If it does not succeed in communicating self-relevant information – i.e., if the person does not feel

"understood" – the self-system becomes inhibited (in accordance with a general principle stating that systems that are not utilized are deactivated or disintegrate). An inhibited self-system cannot be connected to affect-regulating processes, even if the attachment figure succeeds in regulating the feelings of his or her interaction partner.

This might explain why even a very happy childhood by no means guarantees that a child will acquire affect-regulatory autonomy. Children exposed to frequent positive affect (e.g., because their mother is often in a good mood) are more likely to feel happy on a frequent basis (i.e., to find it easier to "enter" positive affective states). According to the systems conditioning model, however, the ability to self-regulate affect will not develop if the restoration of positive affect is not expressed in response to the child's momentary self-expressions or in an understanding personal context. In adulthood, these individuals may always be reliant on others to provide them with encouragement or reassurance in difficult situations. They tend to have "symbiotic relationships"; i.e., they find it hard to accept that those closest to them have feelings "of their own" and are not always prepared to regulate their feelings (Gunsch, 1996; Schülein, 1989).

Empirical Findings on the Systems Conditioning Model

Findings from developmental psychology confirm the assumptions of the systems conditioning model. Even in the first months of a child's life, temporal contiguity of the mother's response to the child's simple self-expressions (e.g., establishing eye contact, smiling, or expressing irritation) is a significant predictor of the child's emotional adaptability later in life. Studies show that children whose mothers do not respond to their child's attempts to establish eye contact within a few hundred ms (i.e., who show low responsiveness) during a 30-min observation period develop significantly more symptoms (bed wetting, physical complaints, aggressiveness, and other adaptive difficulties at preschool age) than children whose mothers respond promptly and appropriately to their child's self-expressions (Keller & Gauda, 1987; Keller, 1997). Like the concept of responsiveness, the concept of emotional availability extends beyond the frequency of positive or negative emotional episodes in parent-child interactions. Availability increases the likelihood that parents will respond promptly and appropriately to their child's self-expressions. An empirical study showed that the emotional availability of parents (especially the mother) covaries with the child's affect-regulatory competencies at age 12 months (Volling, McElwain, Notaro, & Herrera, 2002). It further provided direct confirmation of the chain of cause and effect postulated in the systems conditioning model: from parental regulation of affect contingent on the child's self-expressions ("emotional availability") via the development of self-regulatory competencies to the resulting ability to adapt flexibly to changing situations. One feature of self-regulatory competence ("effortful attention") proved to be a mediator for the relationship between the mother's emotional availability and the child's adaptability to new situations 4 months later. According to the systems conditioning view, the emotional availability of the mother during the first months of life has such a good influence on the future emotional adaptability because the mother's behavior stimulates her child's development of affect-regulatory competencies. Further longitudinal studies show that the development of self-regulation from the quality of early relationships does not only have an impact on the regulation of affect but also on executive functions (e.g., measured with age-appropriate tasks that are analogous to the Stroop test) and even the internalization of behavioral rules in 3-year-olds (Kochanska & Kim, 2014).

- Emotional availability and responsiveness, operationalized by the construct of "mindfulness," have positive effects on the ability to cope with painful events in adult life as well (Brown & Ryan, 2003). By contrast, repeated confrontation with failure impairs emotional regulation, especially in state-oriented individuals, and can even increase the risk for depressive symptoms (Kuhl & Helle, 1986; Hörhold & Walschburger, 1997).

Studies using imaging techniques show that early mother-child interactions activate the same right-hemispheric system (primarily the right

orbitofrontal cortex) that in adulthood provides a (largely unconscious) sense of somatic and emotional self (Devinsky, 2000) and that is activated when people make self-referential judgments (Keenan et al., 2001). Right-hemispheric activation is observed when infants are shown a woman's face (Tzourio-Mazoyer et al., 2002) or express emotions, e.g., a social smile (Holowka & Petitto, 2002); the mother shows right-hemispheric activation when she hears a crying baby (Lorberbaum et al., 2002; Schore, 2003). Results of a twin study (Kästele, 1988) suggest that self-regulatory competencies, measured in terms of action vs. state orientation, are significantly more dependent on experience and less genetically determined than are personality dimensions such as extraversion and neuroticism, which pertain more to the primary emotional reaction than to affect-regulatory competencies.

The systems conditioning model explains why the quality of relationships is so important in child-rearing and therapy, even in therapeutic approaches based on learning theory (e.g., behavior therapy), in which relationships play less of a role than in Gestalt therapy, for example. Even if we were to limit the theoretical scope to classical conditioning, it is vital to recognize the role of relationships: the conditioning processes necessary for affect regulation will only take effect if sufficiently positive personal relationships are experienced at some phase of development (at least if the relationship is "personal," which implies some mutual understanding and communication between the two persons involved). An inhibited self cannot be connected by means of pedagogical or therapeutic measures, however effective these may be. And it is only when this connection is established that the effects of such measures can, at some point, be initiated independently (i.e., self-regulated).

Summary

This chapter focused on individual differences in basic motivational and self-regulatory competencies. Motives can be defined as capacities to regulate the satisfaction of one's needs by drawing on an increasingly intelligent network of experiences acquired across the lifespan. This extended network is based more on need-relevant, pictorial than on conceptual imaginations. It organizes all life experiences in terms of their relevance to the satisfaction of needs but also with reference to other aspects of the *self-system* that are not always directly related to need satisfaction (e.g., individual and cultural values, social roles, self-image, and identity). Intelligent need satisfaction adapts to constantly changing contexts (which the PSI theory explains with the functionality of parallel networks) and overcomes internal and external conflicts by reconciling seemingly contradictory needs (e.g., achievement at work and affiliation in private relationships) and resolving conflicts with the social environment (e.g., with the needs or cultural expectations of others) in a creative way.

The modulation assumptions of PSI theory and the research they are based upon have shown that affect-regulatory competencies are required for the process of self-development on which motivational intelligence depends. It is only when people have experienced a minimum of closeness and affection in their relationships that they seem able to develop a positive basic mood, which in turn enables them to tolerate, rather than repress, painful experiences. Only those who are able to tolerate negative affect have the capacity to learn from painful experiences. And those who also learn to exit painful experiences in a self-regulated manner (downregulation of negative affect) are, after allowing negative experiences, able to activate the extended network of experiences (i.e., extension memory with its self-aspects and motives) into which new experiences must be integrated in order to develop a coherent self. This type of self-development is based on the ("accommodating") revision of existing self-structures when they get in contact with individual experiences that have not yet been integrated. It is this integration of otherwise isolated experiences, and the facility to spontaneously access and process all relevant information in new situations requiring quick decisions rather than prolonged deliberation, that enables people to function as "mature personalities."

Review Questions

1. *Why does taking individual differences into account make it easier to formulate general laws?*

   The neglect of individual differences can be seen as one of the reasons for the many inconsistent effects found in experimental psychology. If, by way of comparison, scholars had attempted to formulate "general" laws of falling bodies without taking individual differences into account, they would never have arrived at the established laws, the general validity of which resides in the very fact that individual differences in object mass are included in the equation.

2. *What is the difference between needs and motives?*

   Needs are subcognitive and subaffective discrepancies between actual and desired states that can trigger (relatively inflexible) behavior, even if they are not cognitively represented or backed up by affect. Motives are largely unconscious cognitive-pictorial preconceptual representations that have been abstracted from need-relevant autobiographical experiences to generate implicit networks of behavioral options and expected outcomes and to facilitate context-sensitive, flexible, and creative behavior as a means to satisfy needs.

3. *Which systems configurations (of affects and cognitive functioning) are particularly adaptive for the achievement and affiliation motives?*

   Stable positive affect can be adaptive for the affiliation motive (e.g., because it facilitates the intuitive regulation of behavior on which interpersonal relationships thrive), whereas affective *change* from inhibition to facilitation of positive affect (from "frustration tolerance" to self-motivation) is crucial for the achievement motive. The ability to tolerate a state of reduced positive affect makes it possible to endure difficulties rather than avoiding them (a process that is supported by the retention of difficult goals in intention memory). Once a solution has been found, the acting individual needs to be able to release inhibition of positive affect and to motivate him- or herself to engage in the appropriate behavior.

4. *Why can motives be seen as components of self-regulation?*

   Motives are need-relevant components of the implicit self-system, which involves emotional and somatosensory processes, serves to integrate information, and is characterized by parallel processing – and thus offers a basis for the monitoring and coordination of all cognitive and affective processes that regulate behavior such that it satisfies a wealth of personal needs, goals, values, and other self-defining characteristics.

5. *Why are motives measured by means of "narrative" methods?*

   Motives develop from an extensive web of autobiographical episodes, i.e., from personal "stories." The high level of cognitive integration characteristic of motives is best attained by asking respondents to generate stories of their own. Questionnaire measures assess conscious goals, which may well deviate from implicit needs and motives (e.g., achievement introjects that have not been integrated into the self and can trigger psychosomatic symptoms: Fig. 13.4).

6. *In what respects does the OMT differ from the TAT?*

   In contrast to the Thematic Apperception Test (TAT), the Operant Motive Test (OMT) does not require participants to

(continued)

relate the stories they generate in full. Instead, they are instructed to note down a few key points. Not only does this approach reduce the distortions that may occur when entire stories are written out, it also saves time, meaning that the number of picture cues shown (and hence the reliability of the test) can be increased. Moreover, the OMT coding system distinguishes four different forms of the approach motive in the domains of affiliation, achievement, and power motivation (with the passive-anxious avoidance form as a fifth variant). The four variants of approach motivation result from combining the type of affect that motivated the imagery reported (i.e., positive vs. negative) with the involvement or noninvolvement of the self (self-regulation vs. incentive-driven motivation; see Table 13.1).

7. *What explanation does the functional design approach offer for the observations that intrinsic motivation resides in the activity itself and is reduced by reward or external control?*

When behavior is driven primarily by incentives or instructions (i.e., "only" performed because of the reward or the instruction), the self is less involved in action control. This means that self-regulatory functions such as self-motivation, which help to upregulate enjoyment of an activity, even if it proves difficult or unpleasant, are lacking. Because self-motivation is largely unconscious, the impression is that enjoyment emanates from the activity itself, i.e., that motivation comes "intrinsically" from engaging in the activity ("flow").

8. *Which four modes of volition can be differentiated?*

The four modes of volition are:

Self-regulation, in which goals that correspond with numerous internal and external needs and values are formulated on the basis of an inner overview (of the self) and positive basic mood; because of their emotional integration with the self, these goals have motivational support.

Self-control, in which the conscious ego focuses on implementing goals despite competing tendencies/alternatives.

Volitional facilitation (vs. inhibition), which provides the energy needed to implement the current action intention, even in the face of difficulties (self-motivation or "prospective action orientation").

Self-facilitation (vs. self-inhibition), which maintains access to self-perception, even in painful or frightening situations, by means of nondefensive (i.e., self-confrontative) downregulation of negative affect (self-reassurance or "action orientation after failure").

9. *Which findings confirm the hypothesis that prospective action orientation maintains action-facilitating affect under stress and facilitates self (rather than other)-initiated behavior?*

Koole and Jostmann (2004) showed that prospectively action-oriented individuals (AOP) respond more quickly to positive stimuli than state-oriented individuals when exposed to demand and that this reaction is mediated by self-access (Fig. 13.1). Dibbelt (1997) showed that prospectively state-oriented individuals only show prolonged reaction times on tasks that require a change in approach after induction of an uncompleted intention (i.e., through loading of "working memory") when that change in approach is "self-willed" and not guided by an external cue (Fig. 13.2).

10. *Why does it not suffice to induce positive control beliefs ("You can do it!") in people who feel helpless or depressed?*

    Helplessness induced by loss of control on a training task leads to objective performance deficits on different kinds of tasks, even when the subjective loss of control is not generalized to the new task. People evidently display generalized performance deficits after experiencing loss of control because they are unable to cope with the negative affect and the rumination it triggers (Kuhl, 1981). Consequently, there is little point in providing depressive individuals with encouragement ("You can do it!") unless they are also helped to develop the objective abilities needed to regulate affect (see Question 15). Otherwise they will soon discover that encouragement was unwarranted because their functional deficits have not been acknowledged or removed.

11. *How is it possible to explain the paradox that ruminating on uncompleted intentions (i.e., activating working memory) actually inhibits their implementation?*

    Prospectively state-oriented individuals (SOP) are characterized by low levels of action-facilitating affect. This leads to activation of intention memory (Goschke & Kuhl, 1993), which is normally associated with action inhibition (e.g., for the purposes of problem solving) and can be overcome only by means of external encouragement (Kuhl & Kazén, 1999) or self-motivation (AOP) (first modulation assumption of PSI theory).

12. *Why is rumination often associated with the confusion of self-selected goals and goals imposed by others?*

    The negative affect associated with uncontrollable rumination inhibits self-access (second modulation assumption of PSI theory), to the effect that the individuals in question are no longer able to distinguish self-selected from other-imposed goals (Fig. 13.3).

13. *How does failure-related state orientation differ from anxiety or neuroticism and prospective action orientation from extraversion?*

    Extraversion (E) and anxiety or neuroticism (N) describe the primary emotional reaction (emotional sensitivity), i.e., a person's propensity to experience positive (E) or negative affect (N) in new situations. Action orientation does not describe how people enter negative affect (AOF) or the inhibition of positive (AOP) affect but how they exit these states.

14. *Why does emotional fixation inhibit goal implementation and self-development?*

    Goal implementation requires communication (interaction) between intention memory (IM) and intuitive behavior control (IBC) and thus a shift from the inhibition of positive affect to its release (by means of self-motivation or external encouragement). Self-development requires contact to be established (interaction) between the system responsible for admitting unexpected or painful isolated experiences (object recognition) and the network integrating all personal experiences (i.e., the self as part of EM), which helps people to cope with pain and anxiety (Fig. 13.5). Contact between the left-hemispheric object recognition system (OR) and right-hemispheric self-perception (EM) can only be established by downregulating negative affect (which enables people to deal with difficult experiences) and thus facilitating access to the self-system.

(continued)

15. *How can emotional fixation be overcome (and affect regulation learned)?*

People learn to regulate their own affects and emotions when the activation of the self coincides sufficiently frequently with the experience of affect being effectively counter-regulated by external encouragement or consolation (provided by parents, friends, spouses, teachers, therapists, etc.; "system conditioning"). The self (like the CS in classical conditioning) can only be linked with affect-regulatory processes (the CR), if the individual expresses his or her own feelings and feels understood by the other person (otherwise, the self is "turned off" and cannot be connected, no matter how effective the experiences of encouragement or reassurance may be).

References

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49–79.

Alsleben, P. (2008). *Das Bedürfnis nach Freiheit. Selbstintegration als viertes Basismotiv*. Saarbrücken, Germany: VDM-Verlag.

Alsleben, P., & Kuhl, J. (2010). Touching a person's essence: Using implicit motives as personal resources in counseling. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Motivating people for change* (2nd ed.). Chichester, UK: Wiley.

Andersen, S. M., & Chen, S. U. (2002). The relational self: An interpersonal social-cognitive theory. *Psychological Review, 109*, 619–645.

Anderson, C. A. (1983). Imagination and expectation: The effect of imagining behavioral scripts on personal intentions. *Journal of Personality and Social Psychology, 45*, 293–305.

Armor, D. A., & Taylor, S. E. (2003). The effects of mindset on behavior: Self-regulation in deliberative and implemental frames of mind. *Personality and Social Psychology Bulletin, 29*, 86–95.

Atkinson, J. W. (Ed.). (1958). *Motives in fantasy, action, and society*. Princeton, NJ: Van Nostrand.

Atkinson, J. W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.

Baddeley, A. (1986). *Working memory*. Oxford, UK: Clarendon.

Bandura, A. (1998). *Self-efficacy: The exercise of control*. New York: Freeman.

Barz, M., Lange, D., Parschau, L., Lonsdale, C., Knoll, N., & Schwarzer, R. (2016). Self-efficacy, planning, and preparatory behaviours as joint predictors of physical activity: A conditional process analysis. *Psychology & Health, 31*(1), 65–78.

Baumann, N., Kaschel, R., & Kuhl, J. (2005). Affect regulation and motive-incongruent achievement orientation: Antecedents of subjective well-being and symptom formation. *Journal of Personality and Social Psychology, 89*, 781–799.

Baumann, N., & Kuhl, J. (2002). Intuition, affect and personality: Unconscious coherence judgments and self-regulation of negative affect. *Journal of Personality and Social Psychology, 83*, 1213–1223.

Baumann, N., & Kuhl, J. (2003). Self-infiltration: Confusing assigned tasks as self-selected in memory. *Personality and Social Psychology Bulletin, 29*, 487–497.

Baumann, N. & Kuhl, J. (2004). How to resist temptation: The effects of external control versus autonomy support on the dynamics of self-regulation. Unervöffentlichtes eingereichtes Manuskript, Universität Osnabrück.

Baumann, N., Kuhl, J., & Kazén, M. (2005). Hemispheric activation and self-infiltration: Testing a neuropsychological model of internalization. *Motivation and Emotion, 29*, 135–163.

Beauregard, M., Levesque, J., & Bourgouin, P. (2001). Neural correlates of conscious self-regulation of emotion. *Journal of Neuroscience, 21*, 6993–7000.

Beckmann, J., & Kuhl, J. (1984). Altering information to gain action control: Functional aspects of human information processing in decision making. *Journal of Research in Personality, 18*, 224–237.

Beeman, M., Friedman, R. B., Grafman, J., Perez, E., Diamond, S., & Lindsay, M. B. (1994). Summation priming and coarse coding in the right hemisphere. *Journal of Cognitive Neuroscience, 6*, 26–45.

Beswick, G., & Mann, L. (1994). State orientation and procrastination. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation*. Göttingen, Germany: Hogrefe.

Bieri, P. (2001). *Das Handwerk der Freiheit: Die Entdeckung des eigenen Willens*. München, Germany: Hanser.

Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behavior. In W. A. Collins (Ed.), *Development of cognition, affect, and social relations the Minnesota symposia on child psychology* (Vol. Bd. 13, pp. 39–101). Hillsdale, NJ: Erlbaum.

Blunt, A., & Pychyl, T. A. (1998). Volitional action and inaction in the lives of undergraduate students: State orientation, procrastination and proneness to boredom. *Personality and Individual Differences, 24*, 837–846.

Bolte, A., Goschke, T., & Kuhl, J. (2003). Emotion and intuition: Effects of positive and negative mood on implicit judgments of semantic coherence. *Psychological Science, 14*, 416–421.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. Journal of Personality and Social Psychology, *84*(4), 822–848.

Brunstein, J. C., Schultheiss, O. C., & Grässman, R. (1998). Personal goals and emotional well-being: the moderating role of motive dispositions. Journal of Personality and Social Psychology, 75, 494–508.

Brunstein, J. C. (2001). Persönliche Ziele und Handlungsversus Lageorientierung: Wer bindet sich an realistische und bedürfniskongruente Ziele? *Zeitschrift für Differentielle und Diagnostische Psychologie, 22*, 1–12.

Brunstein, J. C., & Maier, G. W. (1996). Persönliche Ziele: Ein Überblick zum Stand der Forschung. *Psychologische Rundschau, 47*, 146–160.

Brunstein, J. C., & Olbrich, E. (1985). Personal helplessness and action control: An analysis of achievement-related cognitions, self-assessments, and performance. *Journal of Personality and Social Psychology, 48*, 1540–1551.

Bühler, K. E., & Heim, G. (2002). Psychisches Trauma und fixe Ideen in Pierre Janets dynamisch-handlungspsychologischer Konzeption dissoziativer Störungen. Zeitschrift für Klinische Psychologie, Psychiatrie und Psychotherapie, 50, 394–408.

Byrne, D. (1961). The repression-sensitization scale: Rationale, reliability, and validity. *Journal of Personality, 29*, 334–349.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*, 81–105.

Cantor, N., & Zirkel, S. (1990). Personality, cognition, and purposive behavior. In L. A. Pervin (Ed.), *Handbook of personality research: Theory and research* (pp. 135–164). New York: Guilford.

Carlson, N. R. (1994). *Physiology of behavior* (5th ed.). Boston: Allyn & Bacon.

Carver, C. S., Lawrence, J. W., & Scheier, M. E. (1996). A control-process perspective on the origins of affect. In L. L. Martin & A. Tesser (Eds.), *Striving and feeling: Interactions among goals, affect, and self-regulation* (pp. 11–52). Mahwah, NJ: Erlbaum.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behavior link and social interaction. *Journal of Personality and Social Psychology, 76*, 893–910.

Chuderski, A., & Smolen, T. (2016). An integrated utility-based model of conflict evaluation and resolution in the Stroop Task. *Psychological Review, 123*, 255.

Clemente, C. D., & Chase, M. H. (1973). Neurological substrates of aggressive behavior. *Annual Review of Physiology, 35*, 329–356.

Craik, F. I. M., Moroz, T. M., Moscovitch, M., Stuss, D. T., Winocur, G., Tulving, E., & Kapur, S. (1999). In search of the self: A positron emission tomography study. *Psychological Science, 10*, 26–34.

Damasio, A. R., Tranel, D., & Damasio, H. C. (1991). Somatic markers and the guidance of behavior: Theory and preliminary testing. (217–229. In H. S. Levin, H. M. Eisenberg, & A. L. Benton (Eds.), *Frontal lobe function and dysfunction* (pp. 230–255). Oxford, UK: Oxford University Press.

Dawson, M. E., & Schell, A. M. (1982). Electrodermal responses to attended and nonattended significant stimuli during dichotic listening. *Journal of Experimental Psychology: Human Perception and Performance, 8*, 315–324.

Deci, E. L., & Ryan, R. M. (2000). The what and why of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268.

Deglin, V. L., & Kinsbourne, M. (1996). Divergent thinking styles of the hemispheres: How syllogisms are solved during transitory hemisphere suppression. *Brain and Cognition, 31*, 285–307.

Devinsky, O. (2000). Right cerebral hemisphere dominance for a sense of corporeal and emotional self. *Epilepsy & Behavior, 1*, 60–73.

Dibbelt, S. (1997). Wechseln und Beibehalten von Zielen als Subfunktionen der Handlungskontrolle. Dissertation. Universität Osnabrück.

Diefendorff, J. M., Hall, R. J., Lord, R. G., & Strean, M. L. (2000). Action-state orientation: Construct validity of a revised measure and its relationship to work-related variables. *Journal of Personality and Social Psychology, 85*, 250–263.

Emmons, R. A. (1992). Abstract versus concrete goals: Personal striving level, physical illness and psychological well-being. *Journal of Personality and Social Psychology, 62*, 292–300.

Entwisle, D. R. (1972). To dispel fantasies about fantasy-based measures of achievement motivation. *Psychological Bulletin, 77*, 377–391.

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*, 390–405.

Eysenck, H. J. (1990). Biological dimensions of personality. In L. Pervin (Ed.), *Handbook of personality theory and research* (pp. 244–276). New York: Guilford.

Finkel, E. J., & Campbell, W. K. (2001). Self-control and accommodation in close relationships: an interdependence analysis. Journal of Personality and Social Psychology, 8, 263–277.

Fishbach, A. U., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not into temptations: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology, 84*, 296–309.

Folkman, S., & Lazarus, R. S. (1988). *Ways of coping questionnaire: Manual*. Palo Alto, CA: Consulting Psychologists Press.

Förster, J. & Liberman, N. (2002). Introducing a motivational priming model. Presentation at the 13th General Meeting of the European Association of Experimental Social Psychology, San Sebastian, Spain, June 26–29, 2002.

Freitas, A. L., Liberman, N., & Higgins, E. T. (2002). Regulatory fit and temptation during goal pursuit. *Journal of Experimental Social Psychology, 38*, 291–298.

Friedman, N. P. & Miyake, A. (2016). Unity and diversity of executive functions: Individual differences as a window on cognitive structure. Cortex.

Fromm, E. (1976). *Haben oder Sein*. Stuttgart, Germany: DVA.

Fuhrmann, A., & Kuhl, J. (1998). Maintaining a healthy diet: Effects of personality and self-reward versus self-punishment on commitment to and enactment of self-chosen and assigned goals. *Psychology and Health, 13*, 651–686.

Fujita, K., Trope, Y., Liberman, N., & Levi-Sagi, M. (2006). *Construal levels and self-control. Journal of Personality and Social Psychology*, 90, 351–367.

Gigerenzer, G. (2000). *Adaptive thinking: Rationality in the real world*. London: Oxford University Press.

Gilligan, S. G. (1997). *The courage to love: Principles and practices of self-relations psychotherapy*. New York: Norton.

Gilligan, S. G. (2013). *Therapeutic trances: The cooperation principle in Ericksonian hypnotherapy*. Boston: Routledge.

Gollwitzer, P. M. (1999). Implementation intentions. Strong effects of simple plans. *Journal of Personality and Social Psychology, 73*, 186–197.

Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology, 73*, 186–199.

Goschke, T. (1997). Implicit learning of perceptual and motor sequences: Evidence for independent learning systems. In M. Stadler & P. French (Eds.), *Handbook of implicit learning* (pp. 401–444). Thousand Oaks, CA: Sage.

Goschke, T., & Kuhl, J. (1993). The representation of intentions: Persisting activation in memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19*, 1211–1226.

Graci, M. E., & Fivush, R. (2016). Narrative meaning making, attachment, and psychological growth and stress. *Journal of Social and Personal Relationships, 34*, 486. doi: 0265407516644066.

Gray, J. A. (1982). *The psychology of fear and stress*. Cambridge, UK: University Press.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4–27.

Guevara, M. L. (1994). *Alienation und Selbstkontrolle: Das Ignorieren eigener Gefühle*. Bern, Switzerland: Lang.

Gunsch, D. (1996). Selbstbestimmung und Persönlichkeitsstile in Zweierbeziehungen. Unveröffentlichte Diplomarbeit, Universität Osnabrück.

Gupta, B. S., & Nagpal, M. (1978). Impulsivity/sociability and reinforcement in verbal operant conditioning. *British Journal of Psychology, 69*, 203–206.

Harmon-Jones, E., & Gable, P. A. (2017). On the role of asymmetric frontal cortical activity in approach and withdrawal motivation: An updated review of the evidence. Psychophysiology.

Hautzinger, M. (1994). Action control in the context of psychopathological disorders. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 209–215). Seattle, Washington, DC: Hogrefe.

Heckhausen, H. (1963a). *Hoffnung und Furcht in der Leistungsmotivation*. Meisenheim/Glan, Germany: Hain.

Heckhausen, H. (1963b). Eine Rahmentheorie der Motivation in zehn Thesen. *Zeitschrift für Experimentelle und Angewandte Psychologie, 10*, 604–626.

Heckhausen, H. (1989). *Motivation und Handeln* (2nd ed.). Berlin, Germany: Springer.

Herrmann, M., Baur, V., Brandstätter, V., Hänggi, J., & Jäncke, L. (2014). Being in two minds: The neural basis of experiencing action crises in personal long-term goals. *Social Neuroscience, 9*(6), 548–561.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*, 319–340.

Himmi, T., Boyer, A., & Orsini, J. C. (1988). Changes in lateral hypothalamic neuronal activity accompanying hyper- and hypoglycemias. *Physiology and Behavior, 44*, 347–354.

Hiroto, D. W., & Seligman, M. E. P. (1975). Generality of learned helplessness in man. *Journal of Personality and Social Psychology, 31*, 311–327.

Hoffmann, N. (1998). *Zwänge und Depressionen: Pierre Janet und die Verhaltenstherapie*. Berlin, Germany: Springer.

Holowka, S., & Petitto, L. A. (2002). Left hemisphere cerebral specialization for babies with babbling. *Science, 297*, 1515.

Hörhold, M., & Walschburger, P. (1997). Depressive Störung als Ausdruck misslingender Handlungskontrolle. Überprüfung einer psychophysiologischen Belastungsdiagnostik. *Zeitschrift für Klinische Psychologie: Forschung und Praxis, 26*, 31–27.

Janke, W., Erdmann, G., & Kallus, W. (1985). *Stressverarbeitungsfragebogen (SVF)*. Göttingen, Germany: Hogrefe.

Jung, C. G. (1936/1990). *Typologie*. München, Germany: dtv.

Jungermann, H., Pfister, H.-R., & May, R. S. (1994). Competing motivations or changing choices: Conjectures and some data on choice-action consistency. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 195–208). Göttingen, Germany: Hogrefe.

Kalisch, R., Korenfeld, E., Stephan, K. E., Weiskopf, N., Seymour, B., & Dolan, R. J. (2006). Context-dependent human extinction memory is mediated by a ventromedial prefrontal and hippocampal network. *The Journal of Neuroscience, 26*(37), 9503–9511.

Kanatsou, S., Fearey, B. C., Kuil, L. E., Lucassen, P. J., Harris, A. P., Seckl, J. R., ... & Joels, M. (2015). Overexpression of mineralocorticoid receptors partially prevents chronic stress-induced reductions in hippocampal memory and structural plasticity. *PLoS One*, *10*(11), e0142012.

Kästele, G. (1988). Anlage-und umweltbedingte Determinanten der Handlungs-und Lageorientierung nach Mißerfolg im Vergleich zu anderen Persönlichkeitseigenschaften: eine empirische Untersuchung an zweiundzwanzig ein-und zweieiigen Zwillingspaaren. [Nature- and nurture-related determinants of action and state orientation and other personality traits: A comparison between mono- and dizygotic twins]. Unpublished doctoral dissertation. University of Osnabrück, Germany.

Kazén, M., Baumann, N., & Kuhl, J. (2003). Self-infiltration vs. self-compatibility checking in dealing with unattractive tasks and unpleasant items: The moderating influence of state vs. action orientation. *Motivation and Emotion, 27*, 157–197.

Kazén, M., Kaschel, R., & Kuhl, J. (2008). Individual differences in intention initiation under demanding conditions: Interactive effects of state vs. action orientation and enactment difficulty. *Journal of Research in Personality, 42*(3), 693–715.

Kazén, M., & Kuhl, J. (2005). Intention memory and achievement motivation: Volitional facilitation and inhibition as a function of affective contents of need-related stimuli. *Journal of Personality and Social Psychology, 89*, 426–448.

Kazén, M., & Kuhl, J. (2011). Directional discrepancy between implicit and explicit power motives is related to well-being among managers. *Motivation and Emotion, 35*(3), 317–327.

Keenan, J. P., Nelson, A., O'Connor, M., & Pascual-Leone, A. (2001). Self-recognition and the right hemisphere. *Nature, 409*, 305.

Kehr, H. M. (2004). Implicit/explicit motive discrepancies and volitional depletion among managers. *Personality and Social Psychology Bulletin, 30*, 315–327.

Keller, H. (1997). Entwicklungspsychopathologie: Das Entstehen von Verhaltensproblemen in der frühesten Kindheit. In H. Keller (Ed.), *Handbuch der Kleinkindforschung* (pp. 625–641). Bern, Switzerland: Huber.

Keller, H., & Gauda, G. (1987). Eye contact in the first months of life and its developmental consequences. In H. Rauh & H. Steinhausen (Eds.), *Psychobiology and early development. Advances in psychology* (Vol. 46, pp. 129–143). Amsterdam: North-Holland.

Kircher, T. T. J., Brammer, M., Bullmore, E., Simmons, A., Bartels, M., & David, A. S. (2002). The neural correlates of intentional and incidental self processing. *Neuropsychologia, 40*, 683–692.

Kirschbaum, C., Wolf, O., Wippich, W., & Hellhammer, D. (1996). Stress- and treatment-induced elevations of cortisol levels associated with impaired declarative memory in healthy adults. *Life Sciences, 58*, 1475–1483.

Kochanska, G., Coy, K. C., & Murray, K. T. (2001). The development of self-regulation in the first four years of life. *Child Development, 72*, 1091–1111.

Kochanska, G., & Kim, S. (2014). A complex interplay among the parent–child relationship, effortful control, and internalized, rule-compatible conduct in young children: Evidence from two studies. *Developmental Psychology, 50*(1), 8.

Kohut, H. (1979). *Die Heilung des Selbst*. Frankfurt, Germany: Suhrkamp.

Koole, S. L. (2000). Positivity in self-evaluation. Unveröffentlichte Dissertation, Freie Universität Amsterdam.

Koole, S. L. (2004). Volitional shielding of the self: Effects of action orientation and external demand on implicit self-evaluation. *Social Cognition, 22*, 117–146.

Koole, S. L., & Coenen, L. H. M. (2007). Implicit self and affect regulation: Effects of action orientation and subliminal self priming in an affective priming task. *Self and Identity, 6*, 118–136.

Koole, S. L., Dijksterhuis, A., & van Knippenberg, A. (2001). What's in a name: Implicit self-esteem and the automatic self. *Journal of Personality and Social Psychology, 80*, 669–685.

Koole, S. L., Jager, W., Hofstee, W. K. B., & van den Berg, A. E. (2001). On the social nature of personality: The influence of extraversion and agreeableness and feedback about collective resource use on cooperation in a resource dilemma. *Personality and Social Psychology Bulletin, 27*, 289–301.

Koole, S. L., & Jostmann, N. (2004). Getting a grip on your feelings: Effects of action orientation and social demand on intuitive affect regulation. *Journal of Personality and Social Psychology, 87*, 974–989.

Koole, S. L., Smeets, K., Van Knippenberg, A., & Dijksterhuis, A. (1999). The cessation of rumination through self-affirmation. *Journal of Personality and Social Psychology, 77*, 111–125.

Krohne, H. W. (1996). *Angst und Angstbewältigung*. Stuttgart, Germany: Kohlhammer.

Kuhl, J. (1978). Situations-, reaktions- und personbezogene Konsistenz des Leistungsmotivs bei der Messung mittels des Heckhausen TAT. *Archiv für Psychologie, 130*, 37–52.

Kuhl, J. (1981). Motivational and functional helplessness: The moderating effect of state vs. action orientation. *Journal of Personality and Social Psychology, 40*, 155–170.

Kuhl, J. (1983). *Motivation, Konflikt und Handlungskontrolle*. Berlin, Germany: Springer.

Kuhl, J. (1994a). Action versus state orientation: Psychometric properties of the Action-Control-Scale (ACS-90). In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 47–59). Göttingen, Germany: Hogrefe.

Kuhl, J. (1994b). Motivation and Volition. In G. d'Ydevalle, P. Bertelson, & P. Eelen (Eds.), *Current advances in psychological science: An international perspective* (pp. 311–340). Hillsdale, NJ: Erlbaum.

Kuhl, J. (1996). Wille und Freiheitserleben: Formen der Selbststeuerung. In J. Kuhl & H. Heckhausen (Eds.), *Enzyklopädie der Psychologie: Motivation, Volition und Handlung*. (Serie IV (Vol. Bd. 4, pp. 665–765). Göttingen, Germany: Hogrefe.

Kuhl, J. (1998). Wille und Persönlichkeit: Von der Funktionsanalyse zur Aktivierungsdynamik psychischer Systeme. *Psychologische Rundschau, 49*, 61–77.

Kuhl, J. (2000a). A functional-design approach to motivation and volition: The dynamics of personality systems interactions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Self-regulation: Directions and challenges for future research* (pp. 111–169). New York: Academic.

Kuhl, J. (2000b). A theory of self-development: Affective fixation and the STAR Model of personality disorders and related styles. In J. Heckhausen (Ed.), *Motivational psychology of human development: Developing motivation and motivating development* (pp. 187–211). New York: Elsevier.

Kuhl, J. (2001). *Motivation und Persönlichkeit. Die Interaktion psychischer Systeme*. Göttingen, Germany: Hogrefe.

Kuhl, J. (2010). *Lehrbuch der Persönlichkeitspsychologie: Motivation, Emotion, Selbststeuerung*. Göttingen, Germany: Hogrefe.

Kuhl, J. (2011). Adaptive and maladaptive pathways of self-development: Mental health and interactions among personality systems. *Psychologia Rozwojowa (Polish Journal of Developmental Psychology), 16*, 9–31.

Kuhl, J., & Baumann, N. (2000). Self-regulation and rumination: Negative affect and impaired self-accessibility. In W. Perrig & A. Grob (Eds.), *Control of human behavior mental processes and consciousness: Essays in honor of the 60th birthday of August Flammer* (pp. 283–305). New York: Wiley.

Kuhl, J., & Beckmann, J. (1994a). *Volition and personality: Action versus state orientation*. Göttingen, Germany: Hogrefe.

Kuhl, J., & Beckmann, J. (1994b). Alienation: Ignoring one's preferences. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 375–390). Seattle, WA: Hogrefe.

Kuhl, J., & Fuhrmann, A. (1998). Decomposing self-regulation and self-control: The volitional components checklist. In J. Heckhausen & C. Dweck (Eds.), *Life span perspectives on motivation and control* (pp. 15–49). Mahwah, NJ: Erlbaum.

Kuhl, J., & Goschke, T. (1994). State orientation and the activation and retrieval of intentions from memory. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation* (pp. 127–152). Göttingen, Germany: Hogrefe.

Kuhl, J., & Helle, P. (1986). Motivational and volitional determinants of depression: The degenerated intention hypothesis. *Journal of Abnormal Psychology, 95*, 247–251.

Kuhl, J., & Hüther, G. (2007). Das Selbst, das Gehirn und der freie Wille: Kann man Selbststeuerung auch ohne Willensfreiheit trainieren? *Pädagogik, 11*, 36–41.

Kuhl, J., & Kaschel, R. (2004). Entfremdung als Krankheitsursache: Selbstregulation von Affekten und integrative Kompetenz. *Psychologische Rundschau, 55*, 61–71.

Kuhl, J., & Kazén, M. (1994). Self-discrimination and memory: State orientation and false ascription of assigned activities. *Journal of Personality and Social Psychology, 66*, 1103–1115.

Kuhl, J., & Kazén, M. (1999). Volitional facilitation of difficult intentions: Joint activation of intention memory and positive affect removes Stroop interference. *Journal of Experimental Psychology: General, 128*, 382–399.

Kuhl, J., & Kazén, M. (2008). Motivation, affect, and hemispheric asymmetry: Power versus affiliation. *Journal of Personality and Social Psychology, 95*, 456–469.

Kuhl, J., & Luckner, A. (2007). *Freies Selbstsein: Authentizität und Regression*. Göttingen, Germany: Vandenhoeck & Ruprecht.

Kuhl, J., Quirin, M., & Koole, S. L. (2015). Being someone: The integrated self as a neuropsychological system. *Social and Personality Psychology Compass, 9*(3), 115–132.

Kuhl, J. & Scheffer, D. (1999). Der operante Multi-Motiv-Test (OMT): Manual. Universität Osnabrück.

Kuhl, J., & Weiß, M. (1994). Performance deficits following uncontrollable failure: Impaired action control or global attributions and generalized expectancy deficits? In J. Kuhl & J. Beckmann (Eds.), *Volition and personality: Action versus state orientation*. Göttingen, Germany: Hogrefe.

Lang, J. W., Zettler, I., Ewen, C., & Hülsheger, U. R. (2012). Implicit motives, explicit traits, and task and contextual performance at work. *Journal of Applied Psychology, 97*(6), 1201.

LeDoux, J. E. (1995). Emotion: Clues from the brain. *Annual Review of Psychology, 46*, 209–235.

Lee, F. K., Sheldon, K. M., & Turban, D. B. (2003). Personality and the goal-striving process: The influence of achievement goal patterns, goal level and mental focus on performance and enjoyment. *Journal of Applied Psychology, 88*, 256–265.

Leibowitz, S. F., Weiss, G. F., Walsh, U. A., & Viswanath, D. (1989). Medial hypothalamic serotonin: Role in circadian patterns of feeding and macronutrient selection. *Brain Research, 503*, 132–140.

Levesque, J., Fanny, E., Joanett, Y., Paquette, V., Mensour, B., Beaudouin, G., Leroux, J.-M., Borugouin, P., & Beauregard, M. (2003). Neural circuitry underlying voluntary suppression of sadness. *Biological Psychiatry, 53*, 502–510.

Levy, J., & Trevarthen, C. (1976). Metacontrol of hemispheric functions in human split brain patients. *Journal of Experimental Psychology, 2*, 299–312.

Lewin, K. (1935). *A dynamic theory of personality: Selected papers*. New York: McGraw-Hill.

Libet, B. (1985). Unconscious cerebral initiative and the role of conscious will in voluntary action. *Behavioral and Brain Sciences, 2*, 529–566.

Linville, P. W. (1987). Self-complexity as a cognitive buffer against stress-related illness and depression. *Journal of Personality and Social Psychology, 52*, 663–676.

Little, B. R. (1989). Personal projects analysis: Trivial pursuits, magnificent obsessions, and the search for coherence. In D. M. Buss & N. Cantor (Eds.), *Personality psychology: Recent trends and emerging directions* (pp. 15–31). Berlin, Germany: Springer.

Lorberbaum, J. P., Newman, J. D., Horwitz, A. R., Dubno, J. R., Lydiard, R. B., Hamner, M. B., ... & George, M. S. (2002). A potential role for thalamocingulate circuitry in human maternal behavior. Biological psychiatry, 51(6), 431–445.

Marszal-Wisniewska, M. (2002). Model of volitional and temperamental influences on everyday functioning. *Polish Psychological Bulletin, 33*, 151–157.

Martin, L. L., & Tesser, A. (1989). Toward a motivational and structural theory or ruminative thought. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 306–326). New York: Guilford.

Martin, L. L., & Tesser, A. (1996). Some ruminative thoughts. In R. S. Wyer (Ed.), *Advances in social cognition* (Vol. Bd. 9, pp. 1–47). Mahwah, NJ: Erlbaum.

McClelland, D. C. (1985). *Human motivation*. Glenview, IL: Scott, Foresman.

McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.

McCrae, R. R., & Costa, P. T. (1987). Validation of the five factor model of personality across instruments and observers. *Journal of Personality and Social Psychology, 52*, 81–90.

Meaney, M., Aitken, D., van Berkel, C., Bhatnagar, S., & Sapolsky, R. (1988). Effect of neonatal handling on age-related impairments associated with the hippocampus. *Science, 239*, 766–768.

Meins, E. (1999). Sensitivity, security, and internal working models: Bridging the transmission gap. *Attachment & Human Development, 1*, 325–342.

Meltzoff, A. N., & Moore, M. (1994). Imitation, memory, and the representation of persons. *Infant Behavior, 17*, 83–100.

Metcalfe, J., & Jacobs, W. J. (1998). Emotional memory: The effects of stress on cool and hot memory systems. *Psychology of Learning and Motivation, 38*, 187–222.

Milana, S. A. (1981). The effects of naturally occurring depression and induced mood states on social skill. Dissertation Abstracts International, 42, 2541.

Molnar-Szakacs, I., Uddin, L. Q., & Iacoboni, M. (2005). Right-hemisphere motor facilitation by self-descriptive personality-trait words. *European Journal of Neuroscience, 21*, 2000–2006.

Moosbrugger, H., & Kelava, A. (2007). *Testtheorie und Fragebogenkonstruktion*. Heidelberg: Springer.

Niederberger, U., Engemann, A., & Radtke, M. (1987). Umfang der Informationsverarbeitung bei Entscheidungen: Der Einfluss von Gedächtnisbelastung und Handlungsorientierung. *Zeitschrift für Experimentelle und Angewandte Psychologie, 34*, 80–100.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 84*, 231–259.

Nolen-Hoeksema, S., Parker, L., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology, 67*, 92–104.

Norman, D. A., & Shallice, T. (1986). Attention to action: Willed and automatic control of behavior. In R. J. Davidson, G. E. Schwartz, & D. Shapiro (Eds.), *Consciousness and self-regulation: Advances in research* (Vol. Bd. 4, pp. 1–18). New York: Plenum.

Northoff, G., & Panksepp, J. (2008). The trans-species concept of self and the subcortical-cortical midline system. *Trends of Cognitive Sciences, 12*, 259–264.

O'Donnell, P., & Grace, A. A. (1995). Synaptic interactions among excitatory afferents to nucleus accumbens neurons: Hippocampal gating of prefrontal cortical input. *The Journal of Neuroscience, 15*(5), 3622–3639.

Oettingen, G. (1997). *Psychologie des Zukunftsdenkens*. Göttingen, Germany: Hogrefe.

Oettingen, G., Pak, H. J., & Schnetter, K. (2001). Self-regulation of goal-setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80*, 736–753.

Orbell, S. (2003). Personality systems interaction theory and the theory of planned behavior: Evidence that self-regulatory volitional components enhance enactment of studying behavior. *British Journal of Social Psychology, 42*, 95–112.

Ortony, A., Clore, G. L., & Collins, A. (1990). The cognitive structure of emotions. Cambridge University Press.

Palfai, T. P. (2002). Action-state orientation and the self-regulation of eating behavior. *Eating Behaviors, 3*, 249–259.

Palfai, T. P., McNally, A. M., & Roy, M. (2002). Volition and alcohol-risk reduction: The role of action orientation in the reduction of alcohol-related harm among college student drinkers. *Addictive Behaviors, 27*, 309–317.

Papoušek, H., & Papoušek, M. (1987). Intuitive parenting: A dialectic counterpart to the infant's integrative competence. In J. D. Osofsky (Ed.), *Handbook of infant development* (2nd ed., pp. 669–720). New York: Wiley.

Pauen, M. (2004). *Illusion Freiheit?* Frankfurt, Germany: Fischer.

Pawlow, I. P. (1930/1953). *Kurzer Abriss der höheren Nerventätigkeit. Sämtliche Werke, Bd. III/2*. Berlin, Germany: Akademie.

Peck, J. W., & Blass, E. M. (1975). Localization of thirst and antidiuretic osmoreceptors by intracranial injections in rats. *American Journal of Physiology, 5*, 1501–1509.

Pennebaker, J. W. (1993). Putting stress into words: Health, linguistic, and therapeutic implications. *Behaviour Research and Therapy, 31*, 539–548.

Philippe, F. L., Koestner, R., & Lekes, N. (2013). On the directive function of episodic memories in people's lives: A look at romantic relationships. *Journal of Personality and Social Psychology, 104*(1), 164.

Pizzagalli, D. A., Regard, M., & Lehmann, D. (1999). Rapid emotional face processing in the human right and left brain hemispheres: An ERP study. *Neuroreport, 10*, 2691–2698.

Posner, M. I., & Rothbart, M. K. (1992). Attentional mechanisms and conscious experience. In A. D. Milner & M. D. Rugg (Eds.), *The neuropsychology of consciousness* (pp. 91–111). New York: Academic.

Quirin, M., Kazén, M., & Kuhl, J. (2009). When nonsense sounds happy or helpless: The Implicit Positive and Negative Affect Test (IPANAT). *Journal of Personality and Social Psychology, 97*(3), 500.

Rank, O. (1945). *Will therapy and truth and reality*. New York: Knopf.

Rogers, C. R. (1961). *On becoming a person: A therapist's view of psychotherapy*. Boston: Houghton Mifflin.

Rosahl, S. K., Tennigkeit, M., Kuhl, J., & Haschke, R. (1993). Handlungskontrolle und langsame Hirnpotentiale: Untersuchungen zum Einfluss subjektiv kritischer Wörter. *Zeitschrift für Medizinische Psychologie, 2*, 1–8.

Rotenberg, V. S. (1993). Richness against freedom: Two hemisphere functions and the problem of creativity. *European Journal for High Ability, 4*, 11–19.

Rothermund, K., & Meiniger, C. (2004). Stress-buffering effects of self-complexity: Reduced affective spillover or self-regulatory processes? *Self and Identity, 3*, 263–282.

Russell, J. A., & Carroll, J. M. (1999). On the bipolarity of positive and negative affect. *Psychological Bulletin, 125*, 3–30.

Sapolsky, R. M. (1992). *Stress, the aging brain, and the mechanism of neuron death*. Cambridge, MA: MIT.

Schacter, D. L. (1987). Implicit memory: History and current status. *Journal of Experimental Psychology, 13*, 501–518.

Scheffer, D. (2000). Entwicklungsbedingungen impliziter Motive: Bindung, Leistung und Macht. Dissertation, Universität Osnabrück.

Scheffer, D. (2005). *Implizite motive*. Göttingen, Germany: Hogrefe.

Scheffer, D., Kuhl, J., & Eichstaedt, J. (2003). Der Operante Motiv-Test (OMT): Inhaltsklassen, Auswertung, psychometrische Kennwerte und Validierung. In F. Rheinberg & J. Stiensmeier-Pelster (Eds.), *Diagnostik von Motivation und Selbstkonzept* (pp. 151–168). Göttingen, Germany: Hogrefe.

Schmajuk, N. A., & Buhusi, C. V. (1997). Stimulus configuration, occasion setting, and the hippocampus. *Behavioral Neuroscience, 111*, 235–257.

Schore, A. N. (2003). *Affect regulation and the repair of self*. New York: Norton.

Schülein, J. A. (1989). Symbiotische Beziehungen und gesellschaftliche Entwicklung. *Psyche, 43*, 1007–1028.

Schüler, J., Job, V., Fröhlich, S., & Brandstätter, V. (2008). Dealing with a hidden stressor: Emotional disclosure as a coping strategy to overcome the negative effects of motive incongruence on health. *Stress and Health, 25*, 221–233.

Schultheiss, O. C. (2010). Implicit motives. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed.). New York: Guilford.

Schultheiss, O. C., & Brunstein, J. C. (1999). Goal imagery: Bridging the gap between implicit motives and explicit goals. *Journal of Personality, 67*, 1–38.

Schulz von Thun, F. (2002). *Miteinander reden 3: Das Innere Team und situationsgerechte Kommunikation*. Reinbek, Germany: Rowohlt.

Seligman, M.E.P. (1975). Helplessness: On depression, development, and death. San Francisco, CA: Freeman.

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). *Forgetting all else: On the antecedents and consequences of goal shielding*. Madison, WI: University of Wisonsin-Madison.

Shah, J. Y., & Kruglanski, A. W. (2003). When opportunity knocks: Bottom-up priming of goals by means and the effects on self-regulation. *Journal of Personality and Social Psychology, 84*, 1109–1122.

Showers, C. J., & Kling, K. C. (1996). Organization of self-knowledge: Implications for recovery from sad mood. *Journal of Personality and Social Psychology, 70*, 578–590.

Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.

Smeets, M. A. M., & Kosslyn, S. M. (2001). Hemispheric differences in body image in anorexia nervosa. *International Journal of Eating Disorders, 29*, 409–416.

Spangler, W. D. (1992). Validity of questionnaire and TAT measures of need for achievement: Two meta-analyses. *Psychological Bulletin, 112*, 140–154.

Spirito, A., & Hartford, K. (1990). Social skills and depression in adolescent suicide attempters. *Adolescence, 25*, 543–552.

Squire, L. R. (1992). Memory and the hippocampus: A synthesis from findings with rats, monkeys, and humans. *Psychological Review, 99*, 195–231.

Stiensmeier-Pelster, J. (1994). Choice of decision-making strategies and action versus state orientation. In J. Kuhl & J. Beckmann (Eds.), *Volition and personality, action versus state orientation* (pp. 167–176). Göttingen, Germany: Hogrefe.

Storch, M., & Krause, F. (2007). *Selbstmanagement – ressourcenorientiert* (4. Aufl ed.). Bern, Switzerland: Huber.

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220–247.

Stuchlikova, I., & Man, F. (1999). Motivational structure of state and action oriented alcoholics. *Studia Psychologica, 41*, 63–72.

Sutherland, R. W., & Rudy, J. W. (1989). Configurational association theory: The role of hippocampal formation in learning, memory and amnesia. *Psychobiology, 17*, 129–144.

Svenson, G. R., Oestergren, P.-O., Merlo, J., & Rastam, L. (2002). Action control and situational risks in the prevention of risks HIV and STIs: Individual, dyadic, and social influences on consistent condom use in a university population. *AIDS Education and Prevention, 14*, 515–531.

Tuerlinckx, F., De Boeck, P., & Lens, W. (2002). Measuring needs with the thematic apperception test: A psychometric study. *Journal of Personality and Social Psychology, 82*, 448–461.

Tulving, E. (1985). How many memory systems are there? *American Psychologist, 40*, 495–501.

Tzourio-Mazoyer, N., De Schonen, S., Crivello, F., Reutter, B., Aujard, Y., & Mazoyer, B. (2002). Neural correlates of woman face processing by 2-month-old infants. *NeuroImage, 15*, 454–461.

Uddin, L. Q., Molnar-Szakacs, I., Zaidel, E., & Iacoboni, M. (2006). rTMS to the right inferior parietal lobule disrupts self–other discrimination. *Social Cognitive and Affective Neuroscience, 1*(1), 65–71.

van Elk, M., Rutjens, B. T., & van der Pligt, J. (2015). The development of the illusion of control and sense of agency in 7-to-12-year old children and adults. *Cognition, 145*, 1–12.

Volling, B. L., McElwain, N. L., Notaro, P. C., & Herrera, C. U. (2002). Parents' emotional availability and infant emotional competence: Predictors of parent-infant attachment and emerging self-regulation. *Journal of Family Psychology, 16*, 447–465.

Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98*, 219–235.

Wegner, D. (1994). Ironic processes of mental control. *Psychological Review, 101*, 35–52.

Wegner, D. M., & Wheatley, T. (1999). Apparent mental causation: Sources of the experience of will. *American Psychologist, 54*, 480–492.

Wegner, M., & Teubel, T. (2014). The implicit achievement motive predicts match performances and the explicit motive predicts choices for target distances in team sports. *International Journal of Sport Psychology, 45*(6), 621–638.

Wheeler, M. A., Stuss, D. T., & Tulving, E. (1997). Toward a theory of episodic memory: The frontal lobes and autonoetic consciousness. *Psychological Bulletin, 121*, 331–354.

Wieber, F., Thürmer, J. L., & Gollwitzer, P. M. (2015). Promoting the translation of intentions into action by implementation intentions: Behavioral effects and physiological correlates. *Frontiers in Human Neuroscience, 9*, 1.

Winer, E. S., & Salem, T. (2016). Reward devaluation: Dot-probe meta-analytic evidence of avoidance of positive information in depressed persons. *Psychological Bulletin, 142*(1), 18.

Winter, D. G. (1994). Manual for scoring motive imagery in running text, Version 4.2 Unveröffentlichtes Manuskript. University of Michigan Department of Psychology, Ann Arbor.

Winter, D. G. (1996). *Personality: Analysis and interpretation of lives*. New York: McGraw-Hill.

Winterbottom, M. R. (1953). The relation of need for achievement to learning experiences in independence and mastery. In J. W. Atkinson (Ed.), *Motives in fantasy, action and society* (pp. 453–478). Princeton, NY: Van Nostrand.

Wittling, W. (1990). Psychophysiological correlates of human brain asymmetry: Blood pressure changes during lateralized presentation of an emotionally laden film. *Neuropsychologia, 28*, 457–470.

Wundt, W. (1896). *Grundriß der Psychologie*. Leipzig, Germany: Engelmann.