

20 Enabling Self-Control

A Cognitive–Affective Processing System Approach to Problematic Behavior

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For four decades (1925–1964) social/personality and clinical psychologists reported their most novel findings in the *Journal of Abnormal and Social Psychology* (JASP). The mission of the journal was to publish work that illuminated “basic” and “fundamental” knowledge concerning the “pathology, dynamics and development of personality or individual behavior” (1964, p. 591). It thus reflected the zeitgeist of the time—that people’s experiences and behaviors, whether normal or abnormal, were the product of a common set of underlying processes, and that knowledge of such basic processes could shed light on people’s cognitive and affective reactions.

In 1965, JASP split into two separate publications. Research focusing on the basic processes underlying normal human behavior and group interactions went to what became the *Journal of Personality and Social Psychology*, whereas work examining the processes underlying dysfunctional behavior went to the *Journal of Abnormal Psychology*. For this and many other reasons, cross talk between the two areas slowed and the belief that both areas could be profitably integrated eroded. Nevertheless, many clinical psychologists, especially those working within cognitive and behavioral therapy frameworks, remained committed to basing their practice choices on relevant research findings and theoretical advances (e.g., Linehan, 1993; Shadel, 2004). To facilitate that goal, it is encouraging to see a volume that seeks to embrace the original mission of JASP, providing a capsule for examining how current social and personality psychology can contribute to advances in clinical psychology. For us, the key questions to address in such a volume are: How does the mind generate important

individual differences in diverse types of problematic behaviors of clinical relevance? And how can people be helped to enhance their ability to exert self-control when they sorely need to do so? (See Maddux, Chapter 22, this volume, for more information on the history of the social-clinical interface.)

We begin with the assumption that in order to make sense of the psychological processes that underlie problematic behaviors and enable self-control, it is first necessary to understand how they operate within the larger model of how personality is organized. Over the last 40 years, this conception has undergone dramatic change, with substantial implications for the assessment and treatment of problematic behaviors. For centuries, in a tradition dating to the ancient Greeks and their Big Four humors of personality, trait-dispositional models assumed that personality was to be found in a person's consistent behavior across diverse situations. For example, the person who is high in neuroticism should be more neurotic than most people in many different kinds of situations (home, school, with boss, with friends). Challenging these convictions, Mischel's 1968 monograph, *Personality and Assessment*, showed that rigorous study after study failed to support these classic assumptions. Instead, the findings revealed that the aggressive child at home may be less aggressive than most when in school; the man exceptionally hostile when rejected in love may be unusually tolerant about criticism of his work; the one who shakes with anxiety in the doctor's office may be a calm mountain climber; and the business entrepreneur may take few social risks.

These discrepancies between what theories and intuition predicted and what was actually observed were glaring, creating a paradigm crisis for personality psychology. In the following decades, new research discoveries have enabled a reconceptualization of the structure and organization of personality, its links to situations, and the consistencies and variability that characterize the individual. This model, and the findings that led to it, speak directly to many of the diagnostic and treatment challenges faced in clinical psychology and psychiatry. We begin by describing this reconceptualization and the model to which it has led, called the Cognitive-Affective Processing System (CAPS; Mischel & Shoda, 1995, 1998; Mischel, 2004a). Drawing from research on self-regulation in both children and adults, we then discuss how this model can shed light on the psychological processes that underlie various forms of problematic behaviors, focusing specifically on the critical role that "hot" and "cool" mental representations play in self-control. We conclude by discussing how a CAPS approach can be readily integrated into clinical treatment and assessment.

THE CAPS

The CAPS was developed to take account of findings about two different types of consistency in the behavior of individuals across situations and over time. Each type has its distinctive uses, advantages, and limitations.

- *Type 1: Average overall levels of behavior tendencies.* The first or "classic" form of consistency is seen in the overall average differences in the levels of typical behavior of different kinds (e.g., aggressiveness, sociability, neuroticism) that may characterize the individual. The trait level of analysis captures these by aggregating ratings of what the individual seems like on the whole, as when people are described on the Big Five, on dimensions such as "conscientiousness" and "agreeableness" (e.g., Goldberg, 1993; John, 1990; McCrae & Costa,

1990). While consistency across diverse situations is not zero, it accounts for only a small percent of the variance in actual behavior in different types of situations (e.g., Mischel & Peake, 1982).

- *Type 2: If ... then ... (situation-behavior) signatures.* These consistencies are seen in patterns of stable links between types of situations and types of characteristic behavior. Such patterns have been demonstrated in the signatures of the aggressive behavior and withdrawn behavior characterizing different individuals (Shoda, Mischel, & Wright, 1993b, 1994), and in extensive related research (e.g., Borkenau, Riemann, Spinath, & Angleitner, 2006; Fournier, Moskowitz, & Zuroff, 2008; Moskowitz, Suh, & Desaulniers, 1994).

Uses of the Two Types of Consistency

Is it more useful to try to infer broad traits or situation-specific *if ... then ...* behavioral signatures of personality? The answer, of course, always depends on the particular purpose. Inferences about global traits have limited value for the practical prediction of a person's future behavior in specific situations or for the design of specific psychological treatment programs to help facilitate constructive change. But broad trait ratings have many other uses. Indeed, they have value for everyday inferences about what other people seem like on the whole. With people we know well and who are important to us, and surely in clinical practice, one wants to understand "what makes them tick." Therefore, one needs to understand each person's goals, motivations, and feelings in order to make sense of the *if ... then ...* patterns—the personality signatures—that characterize him or her (Chen-Idson & Mischel, 2001).

To go beyond broad trait descriptions to in-depth assessments of individuals, the CAPS approach incorporates the situation into the measurement of individual differences. It shifts the unit of study from global traits inferred from behavioral signs to the person's cognitions, affects, and actions assessed in relation to the particular psychological conditions in which they occur (Mischel, 1973). The focus thus changes from describing situation-free people with broad trait adjectives to analyzing the interactions between conditions and the cognitions and behaviors of interest. (See also Shadel, Chapter 18, this volume, and Maddux, Chapter 22, this volume.)

Basic Features of the CAPS Framework

CAPS conceptualizes the human mind as a network (using the metaphor of a neural network) of mental representations whose distinctive pattern of activation determines the thoughts and feelings that people experience and the behaviors they display (e.g., Higgins, 1990; see also, Shoda & Smith, 2004). At a molar level of analysis, these mental representations, or *cognitive-affective units* (CAUs), can be thought of in terms of such person variables as encodings, goals, expectations, beliefs, and affects, as well as self-regulatory standards, competencies, plans, and strategies (for description of CAUs, see Table 20.1).

In this framework, different CAUs are interconnected within a stable associative network that guides and constrains the activation of different mental representations with pathways of activation and deactivation. A visual example of this network is illustrated in Figure 20.1. The larger circle in the middle represents the individual's mind; the smaller interconnected set of circles within it represent the CAUs that give rise to the mental representations

TABLE 20.1. Types of Cognitive–Affective Units in the CAPS

1. ENCODINGS: Categories (constructs) for the self, people, events, and situations (external and internal).
2. EXPECTATIONS AND BELIEFS: About the social world, about outcomes for behavior in particular situations, about one's self-efficacy.
3. AFFECTS: Feelings, emotions, and affective responses (including physiological reactions).
4. GOALS: Desirable outcomes and affective states, aversive outcomes and affective states, goals and life projects.
5. COMPETENCIES AND SELF-REGULATORY PLANS: Potential behaviors and scripts that one can do and plans and strategies for organizing action and for affecting outcomes and one's own behavior and internal states.

Note. From Mischel and Shoda (1995, p. 253). Copyright 1995 by the American Psychological Association. Reprinted by permission.

that become activated in response to specific environmental triggers. Each time a person encounters a situation, a subset of these units becomes activated. Once a given unit becomes active, the activation then spreads to other units, following the stable associative links in the individual's network. The sum total of these activations and deactivations gives rise to the behaviors people display.

In this model, individual differences reflect differences in both the chronic accessibility of CAUs and the distinctive organization of interrelationships among them. As the person experiences situations that contain different psychological features, different CAUs become activated in relation to these features. Consequently, the activation of CAUs changes from one time to another and from one situation to another. However, although cognitions and affects that are activated at a given time change, *how* they change—that is, the sequence and pattern of their activation—remains stable, reflecting the stable structure of the organization within the system (Mischel & Shoda, 1995; Shoda & Mischel, 1998). It is this organization that guides and constrains the activation in stable ways, although it is modifiable by new learning experiences and cognitive transformations (e.g., as in therapy). The result is a distinctive pattern of *if ... then ...* relations that are expressed in predictable patterns of behavior as the individual moves across different situations (e.g., Shoda & LeeTiernan, 2002).

The Contextualized If ... Then ... Expressions of Personality Coherence

In CAPS, different situations acquire different meanings for the same person as a function of social learning and biological (e.g., temperament) predispositions. Consequently the kinds of appraisals, expectations, beliefs, affects, goals, and behavioral scripts that are likely to become activated in relation to particular situations will vary. Theoretically, as well as empirically, there is no reason, therefore, to expect the individual to manifest similar behavior in relation to different psychological situations unless these situations are functionally equivalent in meaning. Thus to find the coherence in personality, we have to take into account the situation and its meaning for the individual, which is seen in the stable interactions—the *if ... then ...* relationships—that distinctively characterize the individual (e.g., Cervone & Shoda, 1999; Kunda, 1999; Magnusson & Endler, 1977; Mischel, 1973; Mischel & Shoda, 1995).

To demonstrate the stability and meaningfulness of such *if ... then ...* situation–behavior patterns, the behavior of children was observed in vivo over the course of a summer within a residential camp setting (Mischel & Shoda, 1995). The data collection effort yielded an

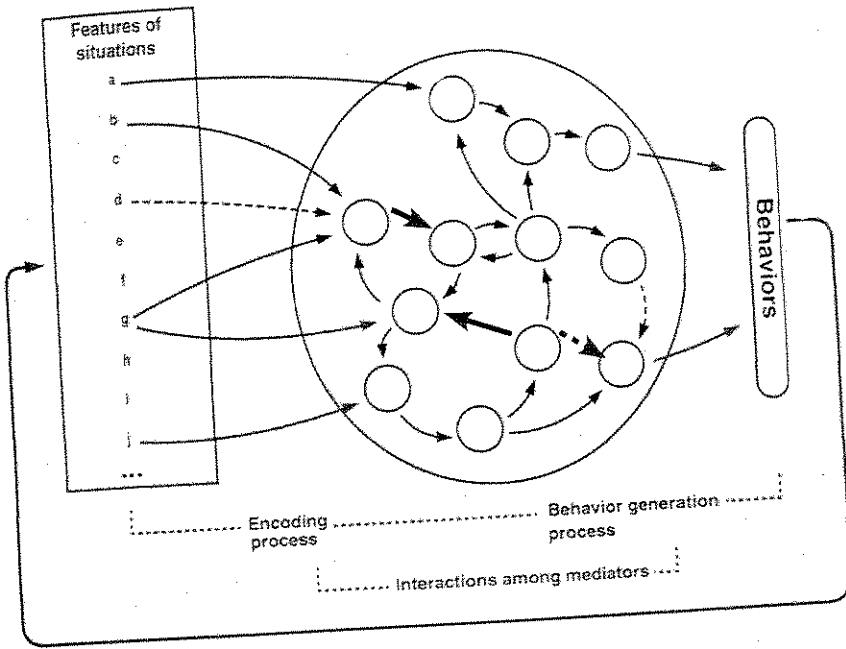


FIGURE 20.1. The CAPS network is illustrated by the large circle, and the smaller circles within it represent the cognitive-affective units (CAUs). The CAUs are interconnected either through excitatory (solid lines) or inhibitory (broken lines); the thickness of a line indicates the strength of the association between any two CAUs. As illustrated, situational features are encoded by CAUs, which, in turn, activates a subset of mediating units that are interconnected through a stable activation network. The dynamics of this network guide and constrain the individual's behavior in relation to particular situation features.

archival database that allowed systematic analyses of coherence in behavior as it unfolded across naturalistic situations and over many occasions (Shoda, Mischel, & Wright, 1989; Shoda et al., 1993a, 1993b, 1994; Wright & Mischel, 1987, 1988). The children's social behavior (e.g., verbal aggression, withdrawal, friendly, or prosocial behavior) was unobtrusively observed and recorded as it occurred in each of the selected interpersonal situations, with an average of 167 hours of observation per child over the course of the 6-week camp.

With this data archive, it was possible to assess the stability of the hypothesized situation-behavior relationships for each person. The frequencies of behavior were first converted to standardized Z-scores within each situation to indicate how much a given person's behavior deviated from normative levels in that situation. This standardization removes situational main effects, so that the remaining intra-individual variance in the profile reflects the unique way a person's behavior varies distinctively and stably across situations in characteristic, meaningful patterns. These patterns are found above and beyond what is expected from the differences in the normative levels of behavior across situations. If personality is conceptualized in terms of stable cross-situational behavioral dispositions, then the mean stability of the intra-individual pattern of variation after standardization should be zero, reflecting no change across situations (Mischel & Shoda, 1995). Alternatively, if the observed situation-behavior relationships reflect enduring coherence in personality, they should show

some significant stability despite the noise, as they in fact do. (For a more elaborate discussion, see Mischel, 2004a; Mischel & Shoda, 1995.)

The findings revealed that individuals who have similar average levels of a type of behavior (e.g., their overall aggression) nevertheless differ predictably and meaningfully in the types of situations in which their aggressiveness occurs (Mischel & Shoda, 1995). It is obvious that people will become more aggressive in situations in which they are provoked or teased than when they are approached positively or praised. But the new finding of theoretical importance was that the person's rank order in relation to others changes systematically and predictably in different situations. The same person who is one of the least aggressive when teased may be well known for his or her characteristically high level of anger and irritation when flattered and praised. As every clinician knows, even if two children have similar overall levels of total aggressive behavior, the one characterized by a consistent pattern of becoming exceptionally aggressive when peers approach him or her to play, but less aggressive than most other children when chastised by an adult for misbehaving, is different psychologically from the one who shows the opposite pattern. Thus, overall, these results showed unequivocally that individuals are characterized by stable, distinctive patterns of variability in their actions, thoughts, and feelings across different types of situations. These behavioral signatures of personality, like psychological fingerprints, identify what is distinctive about the individual (Shoda et al., 1993a, 1994).

From the Individual to Personality Types: Similar Distinctive Processing Dynamics and Behavioral Signatures

One may want to go from considering the unique patterns that characterize the individual to considering groups of people who have similar behavioral signatures, as in different psychiatric diagnostic categories. In CAPS, a personality type consists of people who share a common organization of relations among mediating units in the processing of certain situational features—that is, who have similar “processing dynamics.” The types are defined in terms of distinctive social cognitive and affective processing dynamics that generate characteristic *if ... then ...* patterns of thoughts, feelings, and behavior visible in particular types of situations. To illustrate, the *high rejection sensitivity* individual (Downey & Feldman, 1996; Downey, Feldman, & Ayduk, 2000; Feldman & Downey, 1994) describes individuals who have intense anxieties about interpersonal rejection and abandonment that become evident if they encounter what could be construed as uncaring behavior in their intimate relationships—for example, their partner is attentive to someone else. They scan interpersonal situations for possible cues of rejection and appraise them in terms of their potential rejection threats, anxiously expecting to find them and vigilantly ready to see them (Downey, Mougios, Ayduk, London, & Shoda, 2004). Then they tend to become excessively concerned about whether or not they are loved. Their own ruminations then trigger further a cascade of feelings of anger, resentment, and rage as their fears of abandonment escalate (Ayduk, Downey, & Kim, 2001; Kross, Egner, Ochsner, Hirsch, & Downey, 2007). In reaction, they may engage in coercive and controlling behaviors, often blaming such behaviors on the partner's actions. They readily create a self-fulfilling prophecy in which fears of abandonment become validated by the rejections that they, in part, generate for themselves through their attempts to control (Downey, Freitas, Michealis, & Khouri, 1998). Nevertheless, on average, across a multitude of situations, they may not be more likely than others to express anger, disapproval,

and coercive behaviors, and under some conditions can be exceptionally caring, tender, and thoughtful toward their partners. Diagnostic personality signatures like this (e.g., rejection sensitivity) offer new ways to explore the psychological processes and the social and biological histories that underlie them. A key challenge for future research is to articulate the mechanisms through which these patterns are maintained and can be changed through therapeutic interventions—a topic to which we return later.

Specifying the Active Ingredients of Situations

To develop typologies of processing dynamics and structures that incorporate situations into personality assessment, one has to go beyond their surface features or nominal characteristics of situations (e.g., “in the dining room,” “in group therapy”) to capture their psychologically active ingredients (Shoda et al., 1994). These are the features of the situation that have significant meaning for a given individual and that are related to the experienced psychological situation—the thoughts and affects and goals that become activated within the personality system and that activate the behavior patterns that are expressed. This is seen, for example, in the rejection cues in intimate relations that activate the fears and defensive maneuvers of highly rejection-sensitive people. The importance of finding these features and elaborating their meaning for the individual has long been recognized (e.g., Kelly, 1955), as clinicians who employ functional analyses know, and recent conceptual and analytic developments (e.g., computer simulations) within the social cognitive approach to personality are rapidly facilitating the analyses of such active ingredients of situations (e.g., Cervone, 2004; LeeTiernan, 2002; Shoda & LeeTiernan, 2002; Shadel, Chapter 18, this volume). These innovations make it possible to go beyond the single case to identify types of individuals (e.g., high-rejection-sensitive individuals) for whom particular sets of features have common meanings and activate similar processing dynamics (Ayduk, Downey, Testa, Yen, & Shoda, 1999; Cervone & Shoda, 1999; Shoda & Smith, 2004; Wright & Mischel, 1987).

Summary

The CAPS framework allows researchers to move beyond broad trait-level descriptions of behavior and focus instead on the processes that underlie the way people respond to different kinds of psychological trigger situations. This type of understanding can be particularly useful for clinicians who are interested in facilitating adaptive changes in the way people respond to situations that trigger destructive responses, because it provides a window into the psychological processes that generate them. In the next section we illustrate how this model can shed light on the specific patterns of mental representations that undermine versus facilitate peoples' ability to exert self-control adaptively.

HOT VERSUS COOL MENTAL REPRESENTATIONS IN THE CAPS FRAMEWORK

Assuming that the specific types of situations that elicit problematic responses are known (e.g., the dieter when faced with the desert tray; the alcoholic at cocktail hour; the abusive husband when receiving criticism from his wife), according to the CAPS framework the

next step for facilitating self-control involves identifying the specific types of mental representations that become automatically activated in these situations and determining how to deactivate them. In this sense, the ability to control problematic responses depends on the interaction between automatic and controlled processes that influence the types of mental representations that become active in the individual.

To account for the role that automatic and controlled processes play in the CAPS framework, Metcalfe and Mischel (1999) proposed two fundamentally different types of mental representations—one cognitive or “cool” and the other affective or “hot”—that are controlled by two different subsystems within the broader CAPS framework under situations that require self-control. Briefly, the hot system is an automatic system that responds reflexively to trigger features in the environment, both positive and negative, and elicits automatic, aversive, fight-or-flight reactions as well as appetitive and sexual approach reactions. The hot system consists of relatively few representations, which, when activated by trigger stimuli, elicit virtually reflexive avoidance and approach reactions. The cool system, on the other hand, is conceptualized as a controlled system that is attuned to the informational, cognitive, and spatial aspects of stimuli. It consists of a network of informational *cool nodes* that are elaborately interconnected to each other and generate rational, reflective, and strategic behavior. Whereas the hot system is conceptualized as the basis of emotionality, the cool system is viewed as the basis of self-control.

Although the regions of neural activity underlying these different systems currently remain a vigorously pursued topic of research (for review, see Kross & Ochsner, 2010; also see Lieberman, 2007; Ochsner & Gross, 2005), collectively the findings thus far suggest that the amygdala—a small, almond-shaped region in the forebrain thought to enable fight-or-flight responses—is critically involved in hot system processing (Gray, 1982, 1987; LeDoux, 2000; Metcalfe & Jacobs, 1996, 1998). This brain structure reacts almost instantly to stimuli that individuals encode as arousing (Adolphs et al., 1999; LeDoux, 1996, 2000; Phelps et al., 2001; Winston, Strange, O’Doherty, & Dolan, 2002), immediately cueing behavioral, physiological (autonomic), and endocrine responses. The cool system, in contrast, seems to be associated with prefrontal and cingulate systems involved in cognitive control and executive function (e.g., Jackson et al., 2003; Ochsner & Gross, 2005).

The hot and cool systems operate in continuous interaction with each other to produce phenomenological experiences and behavioral responses (see also, Epstein, 1994; Lieberman, Gaunt, Gilbert, & Trope, 2002). Hot representations and cool representations that have the same external referent are directly connected to one another and thus link the two systems (Metcalfe & Mischel, 1999; see also, Metcalfe & Jacobs, 1996, 1998). Thus hot representations can be evoked by the activation of corresponding cool representations. For example, an abusive husband can become filled with rage by merely conjuring up a fantasy in which he finds his wife cheating on him with another man. Alternatively, hot representations can be cooled through cool-system cognitive processes (e.g., attention switching, reconstrual). Thus the same abusive husband can calm himself down by distracting himself or by recognizing that his fantasy is nothing more than a mental fiction with no real implications for his relationship. Self-control becomes possible to the extent that cooling strategies generated by the cognitive cool system circumvent hot-system activation.

Several factors that influence the balance of hot-cool system processing are relevant for clinicians trying to determine how to aid people in their attempts to exert self-control over problematic behaviors and emotions. In the context of the impulsive responses and

emotional reactions that fully developed adults commonly face, perhaps the most important determinant of hot-cool system balance is stress. At high levels, stress deactivates the cool system and creates hot-system dominance. At lower levels of stress, complex thinking, planning, and remembering are possible. When stress levels jump from low to very high, as in life-threatening emergency conditions, responding tends to be reflexive and automatic. Under conditions in which an animal's life is threatened, quick responses driven by innately determined stimuli may be essential. For humans, however, such automatic reactions may undo rational efforts at constructive self-control.

A second factor is the developmental level of the individual. The hot system develops and dominates early in life, whereas the cool system begins to develop later (at age 4) and becomes increasingly dominant over the course of development. These developmental differences in the balance of hot-cool systems are consistent with research on the differential rates of development of the relevant brain areas for these two systems (for reviews, see Eisenberg, Smith, Sadovsky, & Spinrad, 2004; Rothbart, Ellis, & Posner, 2004). Consequently, early in development young children are primarily under stimulus control, as they have not yet developed the cool-system structures needed to regulate hot-system processing. As the cool system develops over time, it becomes increasingly possible for children to generate cooling strategies as a way to regulate impulses (Mischel, Shoda, & Rodriguez, 1989).

In sum, the hot-cool model helps specify the types of mental representations within the CAPS system that are relevant to understanding the interactions between cognition and emotion that enable self-regulation under highly arousing conditions. In the following sections we describe how this framework can shed light on the psychological processes that underlie people's ability to cope adaptively with a range of problematic behaviors.

Hot-Cool Processes Involved in Coping with Impulsive Tendencies

A key challenge at the heart of many self-regulatory dilemmas involves making the decision to forgo engaging in an immediately rewarding behavior in order to obtain a more desirable long-term goal—for example, the struggling addict's inability to refrain from shooting up in order to achieve his or her long-term goals of professional success and sobriety, or the dieter who desperately wants to lose weight but cannot abstain from consuming the chocolate cake. Understanding how people can adaptively forgo immediately tempting rewards in the service of long-term goal pursuit requires identifying the specific cooling operations that can be used to deactivate hot representations that become activated when people are exposed to psychological trigger situations.

Research from our lab has addressed this issue using a simple laboratory paradigm called the delay-of-gratification task, or the "marshmallow test" in the media. In this task, a young child is presented with a desired treat (e.g., pretzel sticks or little marshmallows) and then posed with a dilemma: The child can wait until the experimenter returns and get two of the desired treats *or* ring a bell to summon the experimenter immediately but receive only one treat. The child prefers the larger outcome and typically commits him- or herself to wait for it. However, as waiting for the chosen goal drags on, the child becomes increasingly tempted to ring the bell and take the immediately available treat.

Although this kind of choice conflict may seem trivial when compared to the problems of self-control that clients suffering from clinical disorders face, this task provides a powerful conflict for young children and an experimental analogue for many of the more difficult

conflicts that people encounter in their everyday lives. Indeed, performance on this task has been shown to predict a number of consequential life outcomes, such as self-regulation in goal pursuit decades later, suggesting that this paradigm is capable of tapping into the processes that are needed to exert self-control in a variety of domains (e.g., Ayduk et al., 2000; Eigsti et al., 2006; Kross & Mischel, 2010; Mischel, Shoda, & Peake, 1988; Shoda, Mischel, & Peake, 1990). The question is: What strategies can a child use to resist the temptation of the immediately available reward? How can he or she replace hot mental representations of the rewards with cooler ones?

Collectively, the findings suggest that there are two primary ways in which delay of gratification can be facilitated in young children. One way is by diverting children's attention from focusing on the appetitive features of the rewards they are trying to delay gratification in order to receive. For example, making the rewards available for children to look at as they attempt to wait for the larger reward leads them to ring the bell more quickly and delay gratification for shorter periods of time, compared to children who wait with the rewards concealed from attention (Mischel & Ebbsen, 1970). In a similar vein, distracting children from focusing on the rewards by giving them a fun toy with which to play (Mischel, Ebbsen, & Zeiss, 1972) or by cueing them to think fun thoughts (e.g., "Think about Mommy pushing you on a swing") as they wait for the larger reward has also been shown to enhance delay time. In contrast, when children are waiting with the rewards exposed without receiving distraction instructions, or when they are cued to focus on sad thoughts, delay reliably decreases (Mischel et al., 1972).

Changing the way children cognitively construe the outcomes for which they are waiting or for which they are working can also enhance impulse control. Here the goal is to modify how children mentally represent the stimulus they are trying to delay gratification in order to receive rather than directing their attention away from the appetitive stimulus. For example, Mischel and colleagues have shown that cueing children to think about the rewards in terms of their concrete, motivating, "hot" features (i.e., "You can think about how gooey and yummy marshmallows taste") undermines children's ability to delay gratification. In contrast, cueing children to focus on the more abstract, informational, "cool" features of desired treats (i.e., "You can think about how round and puffy marshmallows are like cotton balls or clouds") enhances their ability to delay (Mischel & Baker, 1975; Mischel & Moore, 1973; Moore, Mischel, & Zeiss, 1976; for review, see Mischel et al., 1989).

In short, voluntary delay of reward can be aided by attentional and cognitive reconstrual strategies that function to replace mental representations of rewards that are emotionally "hot" and difficult to resist with alternative representations that are "cool" and do not elicit impulsive trigger reactions. Through such distraction and mental rerepresentation, it is possible to convert the frustrating delay-of-reward situation into a psychologically less aversive condition. When considering how people can be helped to self-regulate adaptively, however, there is an important caveat: In the real world, situations that require individuals to exert self-control often involve both strategic cooling processes that enable them to remain calm and reflective in the face of temptation, as well as strategic heating processes to maintain commitment to pursuing the goals rather than quitting. For example, Peake, Hebl, and Mischel (2002) investigated second-by-second attention deployment during efforts at sustained delay of gratification. Self-regulation depended not just on cooling strategies but on flexible deployment of attention—delay in working situations was facilitated most when attention was intermittently shifted to the rewards, as if the children tried to strategically enhance their

motivation to abstain from immediately taking the reward by reminding themselves about them, but then quickly shifted away to prevent excessive arousal (Peake et al., 2002). Such flexibility in attention deployment is consistent with the idea that it is the balanced interactions between the hot and cool systems that sustain delay of gratification, as people exert their motivating and cooling effects in tandem (see also, Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Cheng, 2001, 2003; Mischel et al., 1989).

From Marshmallow to Melancholy: Hot-Cool Processes in Coping with Negative Emotions

Our research has shown that the processes involved in delaying gratification also help people regulate automatically triggered defensive emotional reactions (e.g., angry outbursts, hostile responses). According to the hot-cool model, effective coping in threatening contexts should involve using the same type of strategic attention deployment and cognitive reconstrual strategies to cool the "hot" emotional features associated with threatening situations that children use in the delay-of-gratification task to control their appetitive responses. One study exploring this prediction was an adult follow-up of participants from the original delay-of-gratification studies (Ayduk et al., 2000). This study showed that the number of seconds that high-rejection-sensitive participants were able to wait as preschoolers in the delay situation protected them against the destructive interpersonal effects of rejection sensitivity. Thus, high-rejection-sensitive adults who had high-delay ability in preschool displayed more positive functioning (high self-esteem, self-worth, and coping ability) compared to similarly high-rejection-sensitive adults who were not able to delay in preschool. They also showed lower levels of cocaine/crack use and higher levels of education than high-rejection-sensitive individuals who had low-delay ability in preschool, and in these respects were similar to low-rejection-sensitive individuals (see also, Ayduk et al., 2007).

A similar pattern of results was found in a second study with middle school children. Specifically, whereas high-rejection-sensitive children with low-delay ability were more aggressive toward their peers and had less positive peer relationships than children low in rejection sensitivity, high-rejection-sensitive children who were able to delay longer were even less aggressive and more liked than low-rejection-sensitive children (Ayduk et al., 2000). Similarly, in a cross-sectional study of preadolescent boys with behavioral problems characterized by heightened hostile reactivity to interpersonal threats, the spontaneous use of cooling strategies in the delay task (i.e., looking away from the rewards and self-distraction) predicted reduced verbal and physical aggression (Rodriguez, Mischel, & Shoda, 1989).

We are also conducting research using the hot-cool framework to reconcile a paradox in the coping literature. The paradox is that, on the one hand, abundant findings indicate that it is helpful for people to express and analyze negative past experiences in order to "work through" them (Pennebaker & Graybeal, 2001). On the other hand, their attempts to do so often lead to rumination and brooding, which have been associated with a variety of negative physical and mental health consequences (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Thus the question is: How can people adaptively focus on negative experiences in order to work through them in a cool way, but without spiraling into rumination and becoming overwhelmed with hot-system activation and negative feelings?

To address this question, Kross, Ayduk, and Mischel (2005) proposed that a critical factor determining whether people's attempts to adaptively work through negative experiences lead to the activation of hot or cool mental representations is the type of self-perspective they adopt. Prior research indicates that when people focus on negative past experiences, they typically do so from a self-immersed perspective in which self-relevant events and emotions are experienced in the first-person through their own eyes (Nigro & Neisser, 1983). Drawing from this literature, Kross et al. (2005) hypothesized that when individuals focus on negative feelings from a self-immersed perspective, "hot," episodic information concerning the specific chain of events (i.e., "What happened?") and emotions experienced (i.e., "What did I feel?") would become accessible (cf. McIsaac & Eich, 2004), serving to increase negative affect. In contrast, they predicted that focusing on negative feelings in order to analyze them from a self-distanced perspective in which the individual adopts the vantage point of an observer (e.g., James, 1890; see also, e.g., Leary, 2002; Libby & Eibach, 2002; McIsaac & Eich, 2004; Nigro & Neisser, 1983) should have the opposite effect. Namely, it should reduce people's tendency to reflexively recount what happened to them and instead allow them to reconstrue their experience in cool ways that reduce its aversiveness (Metcalfe & Mischel, 1999; Mischel, 1974; see also, Gross, 2001; Lazarus, 1991).

These hypotheses were supported in a set of studies that manipulated the type of self-perspective (self-immersed vs. self-distanced) participants adopted as they analyzed the reasons they felt angry in an interpersonal conflict (Kross et al., 2005). Specifically, when participants analyzed their feelings from a self-immersed perspective (*immersed analysis* from hereon), episodic information concerning the specific chain of events (e.g., "He told me to back off; I remember watching her cheat on me ...") and emotions experienced (e.g., "I was so angry ...") became more accessible. In contrast, participants who analyzed their feelings from a self-distanced perspective (*distanced analysis* from hereon) focused relatively less on what happened to them (i.e., recounting) and relatively more on reconstruing the event (e.g., "I understand why the fight happened; it might have been irrational but I understand his motivation now"). This shift in the content of peoples' thoughts about their past experience (less recounting, more reconstruing) mediated the effect of the perspective manipulations on negative affect (see also, Strack, Schwarz, & Gschneidinger, 1985). Thus the more reconstruing and less recounting participants engaged in, the less negative affect they displayed. This finding is consistent with research indicating that strategies and interventions that direct individuals to construct narratives about distressing events leads to a variety of physical and mental health benefits (for reviews, see Grossmann & Kross, in press; Pennebaker & Graybeal, 2001; Smyth, 1998), presumably by leading people to assign meaning, coherence, and structure to their emotions (Chung & Pennebaker, 2007).

This work has been replicated, and the initial findings are being extended in multiple directions. In one study, for example, Kross and Ayduk (2008) demonstrated that distanced analysis leads not only to reductions in short-term negative affect but also buffers individuals against future negative affect assessed 1 day and 1 week after the initial experiment, and reduces people's tendencies to ruminate over time (see also, Ayduk & Kross, 2010; Kross, Davidson, Weber, & Ochsner, 2009). In another study, Ayduk and Kross (2008) demonstrated that instructing participants to analyze anger experiences from a self-distanced perspective leads not only to reductions in levels of self-reported anger, but also to reductions in autonomic nervous system reactivity as well.

Summary

The findings reviewed in this section help clarify the psychological processes that underlie people's ability to cope adaptively with a range of situations that require self-control and highlight the role that hot and cool mental representations play in determining the outcomes of self-regulatory efforts. One question that emerges from this work is how the CAPS approach can be integrated into psychotherapy to help clients cope with serious problems of living and dysfunction. In the next section we review recent work that has begun to tackle this question.

CLINICAL IMPLICATIONS

The research reviewed thus far indicates that the stable patterns of *if ... then ...* relations displayed by people are not isolated, functional relations between single situations and responses. Instead, they constitute stable and predictable patterns. Thus the individual who is high in rejection sensitivity may consistently respond to situations in which rejection by an intimate partner is possible with intense aggression and hostility, but may be relatively undisturbed when receiving rejection feedback from a colleague in a nonintimate relationship. The challenge for the clinician is to identify the specific types of psychological situations that trigger problematic behavioral signatures in their clients, and the modifications needed in the mental representations and processing dynamics to make those signatures less automatic and more open to constructive modification.

Although obtaining this kind of information may seem simple in the lab under tightly controlled conditions, in the real world, when people are confronted with many types of complicated experiences, eliciting and identifying this kind of information poses major methodological challenges. Fortunately, a number of research groups are rapidly developing new techniques to overcome these obstacles. For example, Van Mechelen and colleagues have recently developed procedures for performing CAPS-based clinical assessments (Claes, Van Mechelen, & Vertommen, 2004; Vansteelandt & Van Mechelen, 1998). In the first step of their approach the clinician generates a list of psychological situations that a given client encounters on a semiregular basis. This list can be generated either using normative data on the frequency of certain kinds of situations and behaviors or through the use of idiographic interview methods. Subsequently, a list of potentially relevant behaviors and cognitive-affective variables that capture how an individual may respond to different psychological situations must be specified. As with the specification of a list of psychological situations, constructing a list of these behaviors and cognitive-affective variables may be done using both idiographic (i.e., collected from the client through some construct-eliciting procedure) and nomothetic (i.e., derived from a priori clinical theories or previous empirical research) methods.

Once these lists of situations, behaviors, and cognitive-affective variables have been generated, the therapist places them in the form of a grid, the rows of which refer to different situations as experienced by the client in the recent past, and the columns of which refer to the manifest behaviors and underlying cognitive-affective variables (see Figure 20.2; for general guidelines regarding the collection and processing of such data, see Claes et al., 2004). This grid is then presented to the client (or a family member or friend of the client) with the instruction that he or she indicates whether each behavior and cognitive-affective variable

	<i>Encoding:</i> "coalition against me" <i>Affect:</i> anxiety	<i>Behavior:</i> urge to binge <i>Expectancy:</i> exclusion	<i>Behavior:</i> urge to self-injury	<i>Behavior:</i> urge to physical aggression
<i>Situation Cluster 1:</i> rejection by significant others				
<i>Situation Cluster 2:</i> blocking in relation with significant others				
<i>Situation Cluster 3:</i> aggression by other				

FIGURE 20.2. Linkage structure between situation clustering and behavior/CAU clustering as derived from data of eating-disordered patient. A dark cell indicates that the situation cluster, as represented by the corresponding row, elicits the behavioral and cognitive-affective variables included in the corresponding column cluster.

listed across the top row becomes activated (yes or no) in each situation. Once this grid of data is obtained, the main goal of subsequent analysis is to identify the most significant situation-behavior signatures through the use of clustering methods (Van Mechelen, Bock, & De Boeck, 2004, 2005) that are capable of highlighting (1) clusters of functionally equivalent situations (potentially reflecting the most prominent active psychological features of the situations); (2) clusters of co-occurring behaviors and/or CAUs; and (3) a linkage structure between both types of clustering, which can be read as a summary description of the most significant behavioral signatures of the client, along with his or her underlying cognitive-affective process basis.

To illustrate, Claes et al. (2004) presented a case regarding a 20-year-old female client who came to therapy suffering from an eating disorder along with self-injurious behavior. The primary goal of the CAPS assessment was to help the therapist identify the specific types of psychological situations that were triggering maladaptive behaviors and to identify what mental representations were driving these behaviors in order to focus subsequent cognitive-behavioral treatment. To do this, the therapist worked with the client to construct a list of 36 situations that she commonly experienced in her everyday life. The client was then asked to indicate whether she engaged in bingeing and purging behavior and/or self-injurious behavior, along with several forms of aggression, in each one of these 36 situations. In addition, the client was asked to indicate the extent to which she experienced certain kinds of cognitive-affective variables, which were identified on the basis of existing theories and from interviews with the client. Subsequently, the client was asked to indicate whether each behavioral and process variable was present or absent in each situation. These data were then subjected to clustering analysis, which revealed three types of situation-behavior clusters.

One cluster contained situations such as "The parents of my boyfriend hurt me by hiding my diabetes from their family" and "My mother says that I am an unwanted child." These situations had in common rejection by significant others. A second cluster contained situations such as "A friend ignores me because she has to deal with her own divorce problems" and "My mother says that I am an unwanted child" (note that the latter situation reflects an

instance of cluster overlap). These situations have in common that they reflect some kind of blocking in a relationship with significant others. A third cluster included situations such as "A friend of my father grips me and pushes his body against mine" and "During a teaching internship one of the pupils calls me a blond whore." The authors interpreted this cluster as involving aggression displayed by someone other than the client.

Figure 20.2 presents a partial representation of the specific cognitive-affective and behavioral processes (e.g., urge to binge; urge to aggress; expectations of exclusion) that become active in specific types of psychological situations (e.g., rejection by significant other vs. blocked relationship by significant other vs. aggression by other) that the client experiences. Dark cells indicate that a cognitive-affective and/or behavioral process is reliably activated in response to a particular type of psychological situation. For example, the left upper dark cell denotes that rejection by significant others gives rise to the encoding "There is a coalition against me" as well as an anxious affect. As this figure illustrates, the first target symptom behavior, urge to binge, appears to show up in the case of relational problems with significant others. Moreover, in terms of the CAUs that are related to this behavior, the urge to binge co-occurs with the expectancy of being excluded. Second, the behavioral signature of self-injury reveals a close link between this target symptom behavior and direct negative actions (i.e., rejection or aggression) of others.

The results of this analysis provided clear guidelines for subsequent cognitive-behavioral therapy, specifying how clinical intervention could be maximally effective. For example, given the relational nature of the situations driving the client's maladaptive responses, the authors determined that a primary task in therapy was to guide the client in actively selecting and creating more rewarding social situations involving significant others. An example of a concrete plan that might be effective toward accomplishing this involves reestablishing connections with former good friends that were lost. Second, regarding the client's urge to inflict self-injurious behavior in response to the situations listed in Figure 20.2, recommendations were made for teaching the client alternative forms of self-regulatory strategies in order to deal with the negative actions of other people.

The approach described here offers a route to integrating data-driven theory into clinical practice to help clinicians tailor therapy by targeting specific psychological situations and CAUS that trigger and perpetuate problematic responses. In this vein, it offers a potential bridge between the research lab and the clinician's practice. Of course, as an evolving approach to clinical assessment and practice, it raises a host of self-evident questions that, in turn, call for research on its translational value and limits, which we hope will follow in the future.

CONCLUDING COMMENTS

In the 1921 editorial accompanying the first issue of the *JASP*, its editors wrote: "The definition of a science is always an arbitrary matter. Quibbling over what should be included or excluded is futile" (Prince & Allport, 1921, p. 2). Reflecting on this statement now, it seems to apply equally well today. Clearly, important substantive differences exist between "normal" and "abnormal" behavior that warrant the existence of different areas of study, each with its own focus and concerns. While recognizing the need for specialization, in this chapter we have pointed to some of the basic psychological processes that under-

lie behavior of interest to both specialties, focusing on the cognitive–affective dynamics that enable—or undermine—adaptive self-control and self-regulation. Consistent with the goals Prince and Allport had for JASP almost a century ago, we hope it is a step toward psychology's becoming an increasingly integrative science of human behavior, in which clinical and social psychology recognize their common ground and build on each other's efforts, ideas, and findings.

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