Part I

CONCEPTS AND PROCESSES OF SELF-REGULATION

1 Self-Regulation: Principles and Tools

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Abstract

Motivation has been traditionally defined as energy (e.g., running speed) and direction (e.g., toward food), and the determinants of motivation as need (e.g., for food), expectation (e.g., cognitive map of the maze), and incentive value (e.g., quality of the food). When motivation toward attaining a desired future meets resistance or conflict, self-regulation becomes relevant. The use of effective self-regulation tools can support individuals in dealing with such resistance or conflict (e.g., obstacles, difficulties, temptations). We discuss various self-regulation tools and then focus on the effects and mechanisms of two of them: mental contrasting and forming implementation intentions. Recent interventions attest to the effectiveness of combining these two strategies: Mental contrasting with implementation intentions (MCII) is a time- and cost-effective tool that allows adolescents to master their everyday life and long-term development in a self-reliant way.

The other day a friend told us about the difficulties his adolescent son experiences with schoolwork. Our friend was puzzled: His son was well aware that studying was important and feasible, and he strongly intended to study. But then the father found the son doing everything else except studying. So the father simply felt at a loss, and so did the son. We argue

that even when people are highly motivated and strongly intend to change their behavior, they still need self-regulation tools when resistances such as difficulties or distractions arise. We describe such tools, their effects and mechanisms, as well as interventions that allow adolescents to easily acquire and effectively use them in an autonomous way.

Motivation versus Self-Regulation

The terms *motivation* and *self-regulation* call for clear definitions of both. In our definition of motivation we follow Hull (1943) who referred to motivation in terms of intensity and direction. The intensity is defined by the energization or arousal of an organism (Duffy, 1934; see also Oettingen et al., 2009), whereas the direction is defined by whether the behavior aims at approaching or avoiding a certain outcome (Atkinson, 1957; McClelland, 1985). Intensity and direction in turn are determined by need (e.g., for food), expectation (e.g., cognitive map of the maze), and incentive value (e.g., quality of the food; Tolman, 1932).

Gollwitzer (1990, 2012) classified the determinants of motivation into desirability and feasibility. Desirability is the expected value of a desired future (i.e., the subjective attractiveness of reaching it), while feasibility pertains to perceived expectations of attaining it. Expectations are beliefs or judgments of the likelihood of future events that are based on past performance and experience (e.g., Ajzen, 1991; Atkinson, 1957; Bandura, 1977; Mischel, 1973; Oettingen & Mayer, 2002). They might pertain to (a) performing a certain behavior (self-efficacy expectations), (b) producing a desired outcome (outcome expectations), or (c) reaching the desired outcome (general expectations).

In the 20th century, psychological research on behavior change primarily focused on the concept of motivation. Although theoretical approaches and concepts changed over time, incentive value and expectations were and still are considered to be the two core determinants of behavior change, with most motivational theories centering on questions of how the two variables influence behavior. In this vein, behavior change interventions such as motivational interviewing (Miller & Rollnick, 2002; see also Prochaska, DiClemente, & Norcross, 1992) or incremental theory training (Blackwell, Trzesniewski, & Dweck, 2007) utilize strategies geared at modifying incentive value and expectations. The strategies render behavior change more important or strengthen people's expectations of successfully achieving behavior change (see also, Eccles, Fredricks, & Baay, this volume; Wigfield, Tonks, Klauda, & Wenzel, 2009).

Only recently has research on self-regulation gained more attention. In line with William James (1890), we understand self-regulation as helping people deal with resistance and conflict, such as with obstacles and temptations standing in the way of attaining desired future outcomes. Thus self-regulation tools are strategies that target resistance and conflict to help translate high incentive value and expectations of success into appropriate behaviors. In contrast to motivational strategies, self-regulation strategies do not aim at making future outcomes more desirable or feasible, but rather at assuring that they become behaviorally relevant.

After providing an overview of the history and recent research on self-regulation, the present chapter introduces three self-regulation tools: mental contrasting, implementation intentions, and the combination of mental contrasting with implementation intentions (MCII). Mental contrasting is a self-regulation tool that allows people to consider possible resistance and conflict when trying to reach a desired future. Mental contrasting means mentally juxtaposing the desired future (e.g., excelling in the impending exam on Tuesday) with a critical obstacle of reality (e.g., invitation to a party on Saturday). After mental contrasting, but not after relevant control exercises, expectations of success are activated (not changed) and determine behavior (e.g., studying for the exam). As a self-regulation tool, it helps effectively pursue feasible desired futures (summary by Oettingen, 2012).

In a second step, we discuss forming implementation intentions as an additional self-regulation strategy. Implementation intentions are *if*..., *then*... plans that link a critical situation to an action that is instrumental in reaching a desired future (e.g., if my friend calls to join her at the party, then I will tell her that I have to study). These plans allow people to respond to a critical situation in a fast and effortless way and without any further conscious intent (summary by Gollwitzer, 2014).

In a third step, we introduce the combination of both strategies. MCII is a self-regulation tool that enables individuals to hold both the desired future and the obstacles of reality in the mind, and it then provides people with explicit plans for how to deal with these obstacles. MCII has been found to be more powerful in changing behavior than mental contrasting and implementation intentions by themselves, and it is cost- and time-effective to learn and apply (summaries by Oettingen & Gollwitzer, 2010; Oettingen, 2012).

Self-Regulation: Overview

Self-regulation is required when people face resistance or conflict to attaining their desired future (Gollwitzer & Oettingen, 2011; James, 1890;

Oettingen, 2012). Investigating self-regulation, some researchers focus on nonconscious processes (e.g., implicit goal shielding), whereas others target conscious strategies (e.g., distancing); still others focus on conscious strategies that trigger nonconscious processes, which in turn help overcome resistance and conflict (e.g., mental contrasting, forming implementation intentions).

Nonconscious Self-Regulation

Nonconscious Goals. Most approaches to self-regulation have assumed an agentic, conscious individual who makes decisions and behaves in a goal-directed way (Bandura, 2006; Vohs & Baumeister, 2011). However, self-regulation of goal-directed behavior may also occur nonconsiously; that is, it may operate outside of awareness. Research on priming attests to these nonconscious processes; priming is the activation of relevant mental representations outside of awareness (Bargh & Chartrand, 1999). Primes can evoke concepts, procedures, or, importantly, goals (for reviews, see Bargh, Gollwitzer, & Oettingen, 2010; Dijksterhuis & Aarts, 2010).

When goals are primed, mental representations of goals (e.g., to be assertive) are activated and people act to fulfil these goals without knowing it (Oettingen, Grant, Smith, Skinner, & Gollwitzer, 2006). Primes can be presented subliminally or supraliminally (e.g., in the form of words, objects, scents), and the evoked goals may, for example, be to form a good impression or to achieve well, but also to cooperate or to help. Importantly, nonconscious goal pursuit has been shown to produce similar behavioral effects as conscious goal pursuit; goal-primed individuals show resumption after interruption and persistence in the face of difficulties (Bargh, Gollwitzer, Chai, Barndollar, & Trötschel, 2001). Once a nonconscious goal is satisfied, its influence on goal pursuit disappears (e.g., Kawada, Oettingen, Gollwitzer, & Bargh, 2004).

There is an important difference between conscious and nonconscious goal pursuit: Unlike individuals pursuing conscious goals, those pursuing nonconscious goals are puzzled why they did what they did once they become aware of their behavior. Their inability to explain their behavior creates negative affect (i.e., the behavior cannot be readily attributed to the respective goal; Oettingen et al., 2006). When such an explanatory vacuum occurs, people readily jump to any available plausible explanation to reduce their negative affect (Parks-Stamm, Oettingen, & Gollwitzer, 2010).

Goal Shielding. To attain a goal demands shielding the goal from distractions. Goal shielding is more pronounced when goal commitment is high

(Shah, Friedman, & Kruglanski, 2002). Emotions play a different role in goal shielding depending on whether the goal is distal or proximal. If the goal is distal, positive emotions signal strong goal commitment and thus heighten goal shielding; if the goal is proximal, positive emotions signal goal attainment and thus decrease goal shielding (Louro, Pieters, & Zeelenberg, 2007).

Goal Hierarchies. Superordinate goals may consist of various subgoals (Fishbach, Shah, & Kruglanski, 2004). If a superordinate goal is activated, initial success with a subgoal implies strong commitment to the superordinate goal, while initial failure implies weak commitment. In contrast, if the superordinate goal is not activated, initial success on the subgoal implies goal attainment, whereas initial failure implies that the goal is still incomplete (Fishbach, Dhar, & Zhang, 2006).

Conscious Self-Regulation

Walter Mischel, a pioneer in the research on conscious self-regulation, focused on strategies enabling delay of gratification and resistance to temptation (Mischel, 1974; Mischel & Patterson, 1978). In his studies, he effectively established the prerequisites for investigating self-regulation: high incentive value (e.g., marshmallows as rewards for preschool children) and high expectations of success (e.g., trust that the experimenter would respond to a given behavior with the promised rewards).

Delay of Gratification. In his studies on delay of gratification, Mischel first observed and then experimentally manipulated which self-regulation strategies children deployed to wait for a preferred reward (e.g., two marshmallows) instead of consuming a less preferred reward immediately (e.g., one marshmallow; Mischel, 1974; Mischel & Ebbesen, 1970). The children who more successfully waited for the delayed reward employed strategies to distract themselves such as humming, role playing, staring at the ceiling, or even falling asleep. These observations led to a series of experiments testing whether children who had to minimize arousal (e.g., imagine the marshmallow as a cloud) were more successful in delaying the bigger rewards. Effective self-regulation entailed cognitively transforming the rewards so that the immediate urge to consume them was minimized.

Mischel followed his preschool participants until they became adolescents and adults. The results of the preschool studies predicted self-regulation outcomes in adolescence (Mischel, Shoda, & Peake, 1988). Those children who had been able to wait longer at age four or five became

adolescents whose parents rated them as more academically or socially competent, verbally fluent, rational, attentive, organized, and able to master disappointments and stressors. Even into adulthood (beyond 40 years old), those participants who originally were able to wait longer showed more self-control skills on a go/no-go task when asked to suppress a response to a happy face (but not to a neutral or fearful face). When the neural activity of some of the adult participants was assessed, the original patterns of delay of gratification were associated with reliable biases in frontostriatal circuitries, known to integrate motivational and cognitive processes (Casey et al., 2011).

Resistance to Temptations. In their Mr. Clown Box studies, Mischel and Patterson (1978) told preschool children that they had to work on a boring task (putting pegs in a pegboard) to earn permission to play with fun toys. Before starting the pegboard task, children were informed that while working on the task, they would be tempted to do something fun: Mr. Clown Box (a robot) would tempt them to play with him. But in order to play with the fun toys later they would have to keep working on the boring pegboard task. There were four planning conditions (task-facilitating plan vs. temptation-inhibiting plan vs. combination of both plans vs. no plan). In the task-facilitating condition, children had to form the plan: "When Mr. Clown Box says to look at him and play with him, then you can just look at the pegboard and say, 'I'm going to look at my work.'" In the temptation-inhibiting condition, they were provided with the plan: "When Mr. Clown Box says to look at him and play with him, then you can just *not* look at him and say, 'I'm not going to look at Mr. Clown Box.'" In the combined condition, children had to combine the task-facilitating and temptation-inhibiting plans, while in the control condition, children were not asked to form any plan. The temptation-inhibiting plans were more effective than the task-facilitating plans, the combined plans, or no plans. That is, making a plan specifically targeted at looking away from Mr. Clown Box rather than focusing on the boring task was the most effective self-regulation strategy. To be effective, the plans did not need to be rehearsed (repeated several times by using inner speech).

Addressing nonconscious self-regulation, we have discussed the phenomenon of nonconscious goal pursuit as well as the role that goal shielding and goal hierarchies play in goal pursuit. We then focused on strategies that help people distance themselves and minimize their arousal in the service of delaying gratification and resisting temptation. We will now turn to conscious strategies that trigger nonconscious processes to overcome resistance

and conflict: mental contrasting, forming implementation intentions, and the combination of the two (MCII).

Mental Contrasting with Implementation Intentions (MCII)

Mental Contrasting

Fantasy Realization Theory (FRT; review by Oettingen, 2012) identifies mental contrasting as a self-regulation tool that instigates and sustains behavior change. Specifically, mental contrasting of future and reality energizes people when chances of success are perceived as high and de-energizes them when chances of success are perceived as low (Oettingen, 2000; Oettingen, Pak, & Schnetter, 2001).

When mentally contrasting, people imagine a desired future (e.g., settling a conflict with a friend) and then immediately identify and imagine the critical obstacle of reality that stands in the way of attaining this future (e.g., feeling insulted). Mental contrasting activates people's expectations of attaining the desired future; they pursue (commit to and strive for) the desired future when chances look good, and let go when prospects are bleak (Oettingen et al., 2001). In sum, mental contrasting leads people to discriminate in their pursuits between high and low expectations, thereby allowing individuals to conserve energy and resources.

Apart from mental contrasting, FRT has identified three further modes of thought: mentally elaborating the desired future without considering the reality (indulging), imagining the reality without the desired future (dwelling), and reversing the order of elaboration so that the reality is mentally elaborated before the future (reverse contrasting). Contrary to mental contrasting, when people indulge, they do not juxtapose the reality to the desired future, and when they dwell, they have not mentally experienced a desired future. Thus, these one-sided elaborations fail to clarify that obstacles are in the way of the desired future (indulging) or they fail to clarify the direction in which to act (dwelling).

Reverse contrasting, finally, implies elaborating first the present reality and then the desired future; this order prevents the reality from being perceived as impeding the desired future (Kappes, Wendt, Reinelt, & Oettingen, 2013; Oettingen et al., 2001). Accordingly, reverse contrasting leaves goal pursuit unchanged, just like indulging and dwelling (e.g., Sevincer & Oettingen, 2013). To sum up, indulging, dwelling, and reverse contrasting do not instigate prudent (expectancy-based) goal pursuit and behavior change.

Let us return to our friend and his adolescent son. When mental contrasting, the son would imagine excelling on the exam and elaborate the feelings

of happiness. Immediately afterward, he would try to identify his critical obstacle. What is it that gets in the way of excelling on the exam? Feeling peer pressure to party? Browsing the internet? Watching all the latest TV shows? Of the many obstacles that come to mind, what is his most critical obstacle? Fear of failure? Feeling too shy to ask for help? Whatever the obstacle might be, finding and mentally elaborating it will energize the high school student, and he will put in the necessary effort to overcome it.

Effects of Mental Contrasting. Mental contrasting is effective in different life domains, settings, and samples (summary by Oettingen, 2012). For example, an experimental study investigated adolescents in a vocational school for computer programming, where excelling in mathematics was highly desirable for the students (Oettingen et al., 2001, Study 4). Participants had to first identify positive outcomes they associated with improving in mathematics (e.g., increased job prospects, feeling of relief) and then find obstacles in their present reality that might impede their improvement (e.g., procrastination, partying). In the mental contrasting condition, participants had to imagine and write about two aspects of the desired future and two aspects of present reality, in alternating order, starting with a positive future outcome. In the indulging and dwelling conditions, participants had to mentally elaborate either four positive future outcomes or four reality aspects. Two weeks later, when asking the teachers how well participants did in class, those in the mental-contrasting condition had exerted effort and earned grades according to their expectations of success: Those with high expectations were the most energized, showed the most effort, and earned the highest grades, while those with low expectations showed the reverse pattern of results. Students in the indulging and dwelling conditions scored in between regardless of whether their expectations of success were high or low.

Experimental studies replicated these findings in a variety of domains: studying abroad (Oettingen et al., 2001), acquiring a foreign language (Oettingen, Hönig, & Gollwitzer, 2000), meeting a potential romantic partner, completing one's doctoral degree and raising a child (Oettingen, 2000), reducing cigarette consumption (Oettingen, Mayer, & Thorpe, 2010), and solving interpersonal problems (e.g., getting along with one's roommate; Oettingen et al., 2001). Cognitive (e.g., making plans), affective (e.g., feeling responsible), motivational (e.g., anticipating disappointment in case of failure), and behavioral indicators of goal attainment (e.g., investing effort, time, money) were measured subjectively and objectively (e.g., content analysis, observations), right after the experiment or weeks and months later.