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Volition

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Consider a teacher who is expressing concern about a student's academic performance. The teacher says the student lags behind the rest of the class, and needs to do well on an important, upcoming test. The student listens to the teacher's feedback: To prepare for the test, he decides to study an extra hour every day during the next few weeks. The incentive value of regularly studying an extra hour is high as the student wants to excel on the test. Also, he knows from past performance that he actually *can* study every day for an extra hour. Given a high incentive value and high expectations of successfully putting in extra work, the student is motivated and begins to add regular study time starting the next day. However, after a week has passed, the student has managed to add the extra hour just once. Even worse, he did not sleep well last night and is now overly tired. The student still intends to sit down and open his book that evening, but just then a friend calls and asks him over to watch an award-winning movie. In light of these difficulties and temptations, it is now volition that determines whether or not the student will give in and see the movie or go forward with his intention to stay home and study.

Motivation and Volition

In this chapter, we explore how volitional processes affect behavior change. In contrast to motivational processes such as those affecting expectations and incentive values, volitional processes are needed when there is resistance to or conflict with attaining a desired future. In education, volitional processes support students, teachers, and administrators in mastering resistance or conflict (e.g., obstacles or temptations) on the way to reaching a desired future.

We conceptualize motivation as the energy to pursue a desired future and the direction that helps to channel this

energy. Our definition builds upon that of Hull (1943), who proposed that variation in behavior is a function of intensity and direction. The intensity of a behavior is defined by the aroused energy (Duffy, 1934), whereas the direction of action is defined by whether the behavior is aimed at approaching or avoiding a certain stimulus (Atkinson, 1957; McClelland, 1985; see also Oettingen et al., 2009). The sources of intensity and direction are specified as motive disposition, expectation, and incentive value (Atkinson, 1957; Hull, 1943; Tolman, 1932).

Regarding the determinants of motivation, Gollwitzer (1990, 2012) coined the summary terms of desirability and feasibility. Desirability is defined as the expected value of a certain desired future (i.e., the perceived attractiveness of the expected short- and long-term consequences, within and outside the person, of having reached the desired future), while feasibility relates to expectations of attaining the desired future. Expectations are beliefs or judgments of perceived probabilities that are based on experiences in the past (e.g., Bandura, 1977; Mischel, 1973). Expectations come in different forms. There are: (a) expectations of whether or not one is capable of performing a certain behavior that is necessary to achieve a desired outcome (self-efficacy expectations: Bandura, 1977); (b) expectations of whether or not the performed behavior will lead to the desired outcome (outcome expectations: Bandura, 1977; Mischel, 1973); and (c) general expectations of whether or not one will reach the desired outcome (general expectations: Oettingen & Mayer, 2002).

Theory holds and research shows that beliefs pertaining to expectations and incentive values are the key determinants of motivation. Thus motivational strategies can be defined as those that are tailored to change perceived incentive values and expectations to attain a desired future. In educational contexts the aimed-for change of beliefs focuses on increasing

the incentive value of a normative behavior (e.g., studying) and decreasing the incentive value of a non-normative behavior (e.g., attending class unprepared). At the same time, motivational procedures pertain to increasing expectations of performing the normative behavior. Chapter 7 (this volume) discusses the history of research on motivation, and Chapter 12 (this volume) discusses motivation interventions in education.

In contrast, the concept of *volition* comprises self-regulation strategies that target resistance and conflict (e.g., conflicts that may block or delay goal striving). Therefore, volitional strategies often help people to clarify goals when goals are ambiguous or equivocal; they prepare for potential obstacles standing in the way of attaining the desired future; and they enable individuals to stay on track and pursue their desired future even in the face of impediments, difficulties, and temptations. In line with this definition of volition, William James (1890) pointed out that volition is needed when a person faces resistance or conflict. James stated that:

volition is a psychic or moral fact pure and simple, and is absolutely completed when the stable state of the idea is there. . . . The essential achievement of the will, in short, when it is most “voluntary”, is to attend to a difficult object and hold it fast before the mind. (James, 1890, p. 446)

Accordingly, the use of volitional strategies supports individuals as they act upon the pre-existing incentive value of their desired futures and the expectations of attaining them. Put differently, using volitional strategies aims at translating high incentive value and expectations into respective behavior.

In the next sections, we provide an overview of the history and recent research on volitional processes and strategies that are relevant to educational settings. In particular, we discuss two volitional strategies and their combination to illustrate the role that volition plays in learning and performance. These strategies are mental contrasting and forming implementation intentions; combining mental contrasting with implementation intentions (MCII) forms a third kind of strategy.

Volitional Processes and Interventions

As noted above, volition is required whenever people who have a desired future in mind face resistances or conflict (James, 1890; Oettingen, 2000, 2012; Oettingen, Wittchen, & Gollwitzer, 2013). In the context of education theory, volition plays a role in the translation of dispositions and processes of motivation into outcomes of learning and performance (e.g., Corno, 1993, 2004; Corno & Kanfer, 1993). Contemporary approaches to research on volition distinguish between top-down and bottom-up processes of volition (Boekaerts & Corno, 2005). In top-down processes the volition needed is determined by the goals that students pursue. In bottom-up processes the students react to stimuli in their environment (e.g., stressors) and adjust their volition to the situation. We will now briefly describe three prominent examples for the interplay of top-down and bottom-up volitional processes:

goal-shielding, the goal–subgoal hierarchy, and the regulation of conflicts between growth and well-being.

Volitional Processes

Goal shielding. One serious challenge in goal pursuit is shielding the adopted goal from interfering goals and behaviors (Gollwitzer, Bayer, & McCulloch, 2005). Conducive for goal shielding are, for example, high goal commitment (Shah, Friedman, & Kruglanski, 2002) and an action orientation in contrast to a state orientation (Kuhl & Beckmann, 1994). Some assumed mechanisms that drive goal shielding are: environmental control, cognitive control, and emotion control (Kuhl & Beckmann, 1994). Furthermore, the interplay between a person’s present emotions and the proximity of the goal seems to drive goal-shielding processes. If the goal is perceived as distal, positive emotions increase goal shielding because they signal high goal commitment. However, if the goal is perceived as proximal, positive emotions decrease goal shielding because they signal goal attainment; then negative emotions increase goal shielding (Louro, Pieters, & Zeelenberg, 2007).

Goals and subgoals. Recent research also takes into account that more than one goal is activated at any given time, and that every superordinate goal can be broken down into several subgoals (Fishbach, Shah, & Kruglanski, 2004). If the superordinate goal is activated, initial success regarding a subgoal signals high commitment to the superordinate goal; in contrast, initial failure on the subgoal indicates low commitment to the superordinate goal. If the superordinate goal is not activated, however, initial success on a subgoal signals goal attainment, whereas initial failure on a subgoal leaves the goal incomplete (Fishbach, Dhar, & Zhang, 2006). According to this approach, goal pursuit can only be understood in the context of the goal structure that characterizes the individual.

Dual processing self-regulation model. This model is specific to classroom learning and distinguishes between two pathways of self-regulation: the growth pathway and the well-being pathway (Boekaerts & Cascallar, 2006; Boekaerts & Corno, 2005). Assuming that on the growth pathway volition works top-down, students regulate their cognition, emotion, and behavior to pursue the respective goal (e.g., learning a new language). Assuming that on the well-being pathway volition works bottom-up, students regulate their cognition, emotion, and behavior to maintain their well-being in the face of hindrances (e.g., avoiding harm or protecting one’s self-esteem). Students’ self-regulation efforts in the well-being path are cue-driven as they react to hindrances and setbacks in their environment, trying to avoid further misery and instead stabilize well-being.

Volitional Interventions

Various interventions attest to volitional processes in the field of education. Corno (1994) provides an overview of

such interventions, differentiating them by three categories: (1) volitional interventions directed at particular students or content areas; (2) volitional interventions that focus on improving homework; and (3) interventions that aim at collaborative efforts with teachers to design classroom activities that promote volitional control.

Volitional interventions directed at particular students and content areas. Interventions in educational settings often focus only on subjects students learn in school or are directed at students who display particular problems (e.g., impulse control). However, domain-specific instructions may provide insufficient context for retention and transfer (see e.g., Hattie, Biggs, & Purdie, 1996), and not all students need instruction in volitional control. One study by Perels, Dignath, and Schmitz (2009) used a pretest/post-test–control-group design to test a self-regulation intervention in sixth-grade mathematics students in Germany. They observed a teacher instructing one class using the regular math curriculum offering strategies for solving math problems (e.g., segmentation of complex problems into components; control group), and then observed the same teacher instructing another class in using self-regulation techniques when solving the math problems (e.g., dealing with distractions; intervention group). In the post-test, the intervention group reported more self-regulated behavior than the control group, while there was no difference in the pretest. In addition, only in the intervention group did scores of mathematical competences improve over time. Other interventions have targeted processes of volition and motivation in reading and writing for students who are particularly in need of help (Schunk & Zimmerman, 2007).

Interventions for volitional enhancement during homework. Homework can be considered a reference task for studying processes of volitional control. Specifically, it can be used to observe how volitional control is applied by students and how such control is taught by parents and teachers (Corno, 2011). In a recent example, Xu, Yuan, Xu, and Xu (2014) studied variables that predict time management in the context of mathematics homework in a large sample of Chinese secondary students. The more students reported to engage in volitional control (e.g., turn off the TV), the better they reported to manage their time (e.g., I set priorities and plan ahead), even though other important factors (e.g., prior math achievements) were statistically adjusted for. These results have implications for creating volition-enhancing interventions for parents and caregivers. Educators can teach students strategies to improve their homework routines, and students can share their effective strategies for doing homework with others in a class or via social media. Another reference task for studying volitional control is strategic reading (see Pressley et al., 1990, for interventions enhancing reading comprehension and fluency). This area of research is particularly important now that so much studying is done online or using a computer (for examples, see Corno, 2011).

Collaborative interventions with teachers on curriculum development. Randi (2005) collaborated with pre-service teachers to develop the teachers' volitional control skills, by teaching them the theoretical foundations of self-regulation as described in Boekaerts and Corno (2005), as well as knowledge about opportunities to use self-regulation strategies (e.g., emotion control strategies related to teaching effectively). The teachers were also encouraged to recall curricular experiences that allowed them to model specific volitional control strategies. They were taught to focus on negotiating opportunities to teach the curricula they had developed, on evaluating their own teaching practices, and on seeking feedback from mentors.

Interventions deploying conscious and non-conscious processes. Next to classifying interventions according to the needs in the classroom, as discussed above, volitional interventions may be grouped according to whether they deploy conscious processes versus processes that occur outside of awareness (non-conscious processes), or whether they use both conscious and non-conscious processes. Some approaches, including our own lines of investigation, focus on conscious volitional strategies that trigger volitional processes outside of awareness.

Mental Contrasting

Fantasy realization theory (review by Oettingen, 2012) specifies a powerful volitional strategy of behavior change, referred to as mental contrasting. Mental contrasting involves engaging in fantasies about a desired future, and alongside reflecting realities that might impede attaining that future. Mental contrasting produces a wise use of energy: Heightened energy when people perceive their chances of success as being high, and reduced energy when people perceive their chances of success as being low (Oettingen, 2000; Oettingen, Pak, & Schnetter, 2001; Oettingen et al., 2009; summary by Oettingen, 2012).

In educational settings, when students mentally contrast, they first imagine a desired future (e.g., to get a good grade on an upcoming math test), and then imagine the reality that stands in the way of attaining this desired future (e.g., being distracted). Mental contrasting activates expectations of successfully overcoming the reality towards attaining the desired future: If these expectations are high, students will actively pursue (commit to and strive for) reaching the desired future of attaining a good grade. If expectations of success are low, students will refrain from realizing the desired future and will curb their efforts to reach this future, or let go of pursuing this future to save their resources for more promising endeavors (Oettingen et al., 2001). In this way, mental contrasting helps people differentiate between their pursuits, allowing them to invest their resources into futures that warrant success and to refrain from investing in futures they deem futile. Mental contrasting thus qualifies as a strategy that conserves energy and resources, both in the short and the long term.

Beyond mental contrasting, fantasy realization theory specifies three more modes of thought: (a) indulging, which means imagining the desired future without considering the reality; (b) dwelling, focusing on the reality without the desired future in mind; and (c) reverse contrasting, first focusing on the present reality and thereafter elaborating on the desired future. In contrast to mental contrasting, indulging does not juxtapose the resisting reality to the positive future, and dwelling does not incorporate the desired future into thoughts about the reality. Such one-sided thoughts and images do not signal that resistances need to be overcome to attain the desired future (indulging) and they do not suggest in which direction to act (dwelling). Finally, with respect to reverse contrasting, it is important to keep in mind that the effects of mental contrasting depend on people perceiving the present reality as impeding the desired future. In mental contrasting, individuals first imagine the desired future, and thus the future works as the reference point. Only then do they elaborate the present reality. Thus the reality can change its meaning and become an obstacle to attain the desired future (Kappes, Wendt, Reinelt, & Oettingen, 2013). Reversing this order (i.e., reverse contrasting), by first imagining the present reality, and then the desired future, does not present the reality as impeding or standing in the way of the desired future. Therefore, reverse contrasting does not promote goal pursuit and behavior change in line with expectations of success (e.g., Kappes et al., 2013; Oettingen et al., 2001, Study 3; Sevincer & Oettingen, 2013). In sum, indulging, dwelling, or reverse contrasting do not activate expectations of success and none of them leads to prudent pursuit of the future that is in line with one's chances to attain the desired future (Oettingen et al., 2001; Oettingen, 2012).

Think about the classroom context, and an elementary-school student who wants to improve her reading skills during the next term. The student's incentive value is high; she loves science fiction and is keen on learning how to read the books on her own. She has high expectations of successfully improving her reading skills; thus far, she has been a good student. Using mental contrasting, the student first vividly imagines how truly wonderful it would be to read her favorite science fiction book all by herself, independently and without any assistance from her parents (desired future). Then she identifies what it is in herself that holds her back from practicing her reading skills. What is her main obstacle? The student discovers that her main obstacle is that she is constantly distracted by social media, with all the tempting news of her friends (obstacle of the present reality). She now imagines these feelings of temptation, how she is tempted to look at her friends' cool pictures and getting the latest news. After this short imagery-based exercise of mental contrasting, the student recognizes that constantly looking at her social media outlets prevents her from becoming an independent and self-reliant reader. Now she will shut off her media applications, at least for a while, and practice reading.

Effects of mental contrasting. Mental contrasting has been shown to effectively change behavior in many different

educational settings and with diverse student samples (see summary by Oettingen, 2012). For example, one experimental study investigated first-year students in a vocational school for computer programming. For these students, mathematics was the most critical subject and they viewed improving their math skills as highly desirable. Oettingen et al. (2001, Study 4) instructed the participants to identify factors they associated with excelling in mathematics (participants named e.g., better chances to get a good job, to simply be happy), and to identify aspects of their present reality that may stand in their way of excelling (participants named e.g., not enough sleep and partying). Three modes of thought were then experimentally induced. Participants were directed to imagine and write about two aspects of their desired future and two aspects of their present reality, in an alternating order, beginning with the desired future (mental contrasting condition). Alternatively, they had to mentally elaborate four aspects of the desired future (indulging condition) or four aspects of the present reality (dwelling condition). Participants were then asked, directly following the experimental procedure, to rate (on five-point scales) how energized they felt with respect to excelling in mathematics (e.g., how active, eventful, energetic). Two weeks later, participants' teachers reported how much effort each student had invested in schoolwork during the past 2 weeks. In addition, the teachers provided course grades for each student during that time period.

For students in the mental contrasting condition, the link between expectations of success and being energized was significantly stronger than in the indulging and dwelling conditions. In addition, mental contrasting students were found to have exerted significantly more effort, and earned grades in line with their expectations of success: Those with high expectations of success felt most energized, exerted most effort, and were awarded with the highest grades. The reverse was true for those with low expectations of success. Students in the indulging and dwelling conditions ranged in between, regardless of their expectations of success.

A series of further experimental studies replicated these results. Those pertinent to education involved: studying abroad in university students (Oettingen et al., 2001, Study 2), acquiring English as a foreign language in middle-school students (Oettingen, Hönig, & Gollwitzer, 2000, Study 1), excelling in giving an ad hoc presentation in university students (Oettingen et al., 2009, Study 2), seeking help from academic experts in university students (Oettingen, Stephens, Mayer, & Brinkmann, 2010, Study 1), increasing tolerance towards members of minorities in high-school students (Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005, Study 2), and successfully combining work and family life while raising a child as a graduate student (Oettingen, 2000, Study 2). Further, strength of goal pursuit was assessed in these studies by cognitive (e.g., making plans), affective (e.g., feelings of responsibility to attain the desired future), motivational (e.g., feelings of disappointment), and behavioral indicators (e.g., exerted effort and spent resources). Indicators were measured subjectively (e.g., self-report) and objectively (e.g., content analysis, independent observations), directly

after the experiment or weeks and months later. Across experiments, the described pattern of findings was observed: Participants with high expectations in the mental contrasting condition vigorously pursued their desired future, while participants with low expectations decreased their efforts or let go altogether. Participants in the indulging or dwelling conditions pursued their future with moderate effort and success regardless of whether their expectations of success were high or low. To summarize, only mental contrasting participants regulated their goal pursuit so that their resources were protected. They showed high investment when the attainment of the future was likely and low or no investment when attainment was unlikely.

It was hypothesized and found that mental contrasting does not change expectations of success, but activates pre-existing expectations of success, translating them into goal pursuit and behavior change (Oettingen, 2012). In two studies, Oettingen, Marquardt, and Gollwitzer (2012) investigated whether mental contrasting translates expectations into heightened effort and performance even if they are induced *in situ* via positive situational feedback. The authors used a creativity task to provide positive or moderate bogus feedback to college students. Thereafter participants engaged in mental contrasting, indulging, dwelling, or in contrasting irrelevant content. Mental contrasting increased creative performance after positive feedback compared with moderate feedback. Indulging, dwelling, and irrelevant contrasting did not change creative performance, regardless of feedback. Importantly, by manipulating expectations through bogus feedback, the Oettingen et al. (2012) studies showed that mental contrasting indeed translates expectations of success into behavior change, rather than affecting a third variable that may underlie both expectations of success and behavior. Further, these studies suggest that if the prerequisite of high expectations of success is not met, then such expectations can be induced on the spot through the provision of positive performance feedback. This is an important finding for teachers who wish to increase energy and study efforts in their students. By providing students with doable challenges (e.g., in math) and giving them respective positive feedback, teachers can take advantage of the students' heightened expectations: mental contrasting will then effectively increase students' efforts and successful performance, even in areas and tasks that they had not been strong in originally (e.g., to excel in math tests).

Processes of mental contrasting. The effects of mental contrasting on behavior change are mediated by cognitive and motivational processes. As for cognitive changes, mental contrasting paired with high expectations strengthens the mental associations between future and the obstacle of reality as well as between the obstacle and the instrumental means to overcome it. It also changes the meaning of reality, in that the reality now becomes interpreted as an obstacle (Kappes & Oettingen, 2014; Kappes, Oettingen, & Pak, 2012; Kappes et al., 2013). Regarding motivational changes, mental contrasting catalyzes energy (measured by systolic blood pressure). That is, when prospects are good, it heightens energy,

when they are bad it relaxes, so that the saved energy can be used for alternative projects. Importantly, changes in energy mediate the relation between expectations and goal pursuit (Oettingen et al., 2009; Sevincer, Busatta, & Oettingen, 2014). Finally, regarding responses to negative feedback, mental contrasting changes the ways students deal with negative feedback. When the desired future seems reachable, negative feedback is processed as valuable information for reaching the desired future. It is processed without impairing a student's subjective competence, and it bolsters beneficial attributions (Kappes et al., 2012).

Taken together, mental contrasting will help students to attain success (e.g., excelling in a test, being friendly to the teacher) without consciously exerting effort. That is, the described processes mediating the effects of mental contrasting happen outside of awareness. Specifically, the building of mental associations between the desired future (e.g., good job opportunities) and obstacles of the present reality (e.g., poor language skills), and between the obstacles and instrumental means that deal with these obstacles (e.g., asking the teacher for help with language homework) will lead the student to actually go ahead and realize the desired future (e.g., ask the teacher for support; e.g., Oettingen et al., 2010c). Again, without awareness, mental contrasting will also provide the necessary energy and effort to reach the desired future (e.g., seek the teacher's help).

It comes as no surprise, then, that objective measures of effort and performance show the effects of mental contrasting more clearly than self-report measures. In other words, it may be hard for students to report on the exerted effort, as this effort is triggered outside of awareness. Finally, mental contrasting prepares them to effectively respond to critical feedback, by allowing them to non-consciously process immanently useful information entailed in the negative feedback. Mental contrasting is beneficial also because it shelters students from taking negative feedback from their teacher personally. Reducing students' defensiveness should aid student-teacher interactions when negative feedback is impending. In their entirety the reported processes instigated by mental contrasting support students to master some of the most difficult tasks in the educational context: initiating appropriate behavior change and carrying on in light of difficulties and setbacks.

Mental contrasting as a metacognitive intervention. So far, mental contrasting has been shown to be a volitional self-regulation strategy that helps people initiate and sustain behavior change across time and in the face of difficulties. The question arises whether mental contrasting could be taught as a metacognitive strategy, that is, as a strategy that implies thinking about one's own thinking (Flavell, 1979). Can students learn mental contrasting as a skill that enables them to wisely select and prudently pursue their own idiosyncratic wishes? Can teachers and administrators learn and adopt the strategy in everyday life? Such use of mental contrasting may support individuals as they study, teach, or provide other services of schooling that call for effective time management and prioritizing goals.

Effective time management and decision making. Corno (2001) made the case that time and resource management as well as prioritizing goals is an important volitional skill for students in school and in everyday life. Mental contrasting, which promotes selective goal pursuit, should benefit students, teachers, and administrators by improving their time management and decision making. The effectiveness of mental contrasting for time management and decision making was shown in a study with middle-level health care administrators who had to work on many projects simultaneously and constantly adjust their time schedules (Oettingen, Mayer, & Brinkmann, 2010). The administrators were taught mental contrasting as a metacognitive strategy. That is, participants learned how to apply mental contrasting to a host of wishes or concerns in their everyday lives.

The administrators were randomly assigned to two conditions. In one condition, participants were taught to use mental contrasting regarding important everyday concerns, while participants in the other condition were taught to indulge in respective future fantasies. Participants generated concerns such as solving a conflict with an employee, writing a report, or organizing a dinner party, all of which they then either practiced using mental contrasting or indulging. The selected problems had to be controllable and participants needed to be able to act upon them. However, participants also had to feel somewhat uneasy about how to solve them. Each participant practiced the respective strategy (mental contrasting vs. indulging) using at least six such problems, and were then told to apply it to as many problems as possible during the upcoming weeks (Oettingen et al., 2010a). Two weeks later, compared to those in the indulging condition, participants in the mental contrasting condition reported to have managed their time more effectively and to have made better everyday life decisions.

As outlined above, mental contrasting with low expectations of success leads to relatively weak goal pursuit or even goal disengagement. However, sometimes goal disengagement from certain focal goals is unwanted for ethical or practical reasons. For example, it is not desirable for students to disengage from the goal of attending school or learning basic skills such as reading, writing, or math. In these cases, mental contrasting can still strengthen goal pursuit, if expectations of success are high. There are three ways to ensure that all participants who use mental contrasting hold high expectations of success. As described above, one way to instill positive expectations *in situ* is by giving positive performance feedback (Oettingen et al., 2012). Another way is to assign participants a new task, for which they have no pre-existing performance experiences and to assure them that it is feasible for them to succeed (A. Gollwitzer, Oettingen, Kirby, Duckworth, & Mayer, 2011). And finally, one can ask participants to generate an idiosyncratic (academic or well-being) wish or concern that is challenging yet feasible (Oettingen, 2012).

Learning a foreign language. Applying the second of the three options, A. Gollwitzer et al. (2011) showed in two studies that mental contrasting managed to heighten

academic performance for elementary and middle-school children. The intervention was directed at second- and third-graders in Germany and fifth-graders in the United States. The children had to either learn vocabulary in a foreign language (English for the German participants) or they had to learn to say *thank you* in ten different languages (participants were fifth-graders in the United States). To guarantee high expectations of success, participants were not given the opportunity to gain prior experience with the task and it was ensured that it was possible for all students to succeed (A. Gollwitzer et al., 2011). Across studies, participants in the mental contrasting condition were more successful in learning the new vocabulary than students in the indulging (control) condition.

Increasing well-being: Eating healthier and becoming more active. Applying the third option mentioned above, college students who were interested in improving their well-being named respective idiosyncratic wishes for the next 2 weeks (e.g., eating healthier, losing weight). Thereafter, they were either instructed to mental contrast or indulge in fulfilling these wishes (Johannessen, Oettingen, & Mayer, 2012); a third group received no treatment. Two weeks later, compared to those in the indulging or no treatment condition, students in the mental contrasting condition reported an overall lower calorie intake, as they consumed less high-calorie foods and more low-calorie foods (Johannessen et al., 2012). Interestingly, the effects of mental contrasting transferred across domains. Students in the mental contrasting also reported more physical activity compared to participants in the other two conditions (Johannessen et al., 2012).

Summary. Mental contrasting is a volitional strategy that allows for both engagement to, and disengagement from, desired futures—depending on the feasibility of realizing the envisioned future. Specifically, mental contrasting produces cognitive changes (e.g., mental associations, changes in the meaning of reality), energy (e.g., systolic blood pressure), and constructive mastery of negative feedback (e.g., careful processing of information) that in turn predicts behavior change in line with how feasible the desired future is perceived. Thus, mental contrasting is a conscious strategy that produces changes in cognition outside of awareness, which in turn predicts the observed behavior change. Engaging in promising and disengaging from futile futures guarantees that a person who uses mental contrasting saves resources for successfully managing everyday life and long-term development. Mental contrasting is easy to apply and can be taught as a metacognitive strategy, unfolding its effects in such diverse life domains as excelling in academic performance, promoting one's health and well-being, and managing time and other resources.

Implementation Intentions

When pursuing academic goals, students are often confronted with the following challenges: they need to get started and take the first steps toward pursuing their goals; they must stay on track when goal striving has started; they

should not overextend when striving for a given goal; and finally, they should disengage from an unattainable goal or futile means of attaining that goal (Gollwitzer & Sheeran, 2006). Planning in advance how one wants to deal with these challenges is an effective remedy. Gollwitzer (1993, 1999, 2014) highlighted the importance of forming implementation intentions that specify plans with the format of “If situation *X* is encountered, then I will perform the goal-directed response *Y*!” Thus, implementation intentions define when, where, and how one wants to act. For instance, a student who wants to make more constructive contributions in class might form the following if-then plan: “And if another student is desperately trying to answer a difficult question, then I’ll immediately jump to his rescue!” Empirical data support the assumption that implementation intentions help raise the rate of goal attainment. A meta-analysis based on close to a hundred studies shows a medium to large effect on increased rate of goal attainment ($d = 0.61$; Gollwitzer & Sheeran, 2006).

Underlying processes of implementation intention effects. Research on the underlying processes of implementation intention effects has revealed that implementation intentions facilitate goal attainment on the basis of psychological mechanisms that relate to both the anticipated situation (specified in the if-part of the plan) and the association created between the if-part and the then-part of the plan (Gollwitzer, 1999). Because forming an implementation intention implies the selection of a critical future situation, the mental representation of this situation becomes highly activated and hence more accessible. For instance, Achtziger, Bayer, and Gollwitzer (2012) observed in a cued recall experiment that participants more effectively recalled the available situational opportunities to attain a set goal, given that these opportunities had been specified in if-then links (i.e., in implementation intentions); this effect showed up no matter whether the cued recall was requested 15 minutes or 24 hours later. Furthermore, a study by Parks-Stamm, Gollwitzer, and Oettingen (2007), using a lexical decision task paradigm, showed that implementation intentions not only increased the activation level of the specified critical cues, they also diminished the activation level of non-specified competing situational cues.

Forming implementation intentions creates strong associations between the specified critical situations and goal-directed responses. Thus, the execution of the goal-directed response, once the critical situational cue is encountered, can be expected to exhibit features of strong associations, such as automaticity in terms of immediacy, efficiency, and no need for conscious intent. Indeed, there is vast empirical evidence that if-then planners act more quickly (e.g., Gollwitzer & Brandstätter, 1997, Experiment 3), deal more effectively with cognitive demands (e.g., speed-up effects still emerge under high cognitive load and thus qualify as efficient; e.g., Brandstätter, Lengfelder, & Gollwitzer, 2001), and do not need to consciously intend to act in the critical moment (e.g., Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009).

Further support for the hypothesis that action control by implementation intentions qualifies as automatic is also obtained in studies assessing brain data. In a functional magnetic resonance imaging study reported by Gilbert, Gollwitzer, Cohen, Oettingen, and Burgess (2009), acting on the basis of goal intentions was associated with brain activity in the lateral rostral prefrontal cortex, whereas acting on the basis of implementation intentions was associated with brain activity in the medial rostral prefrontal cortex. Brain activity in the latter area is known to be associated with bottom-up (stimulus) control of action, whereas brain activity in the former area is known to be related to top-down (goal) control of action (Burgess, Dumontheil, & Gilbert, 2007). Moreover, the automaticity of implementation intentions effects has also been supported by studies that collected brain data employing electroencephalography (e.g., Gallo, Keil, McCulloch, Rockstroh, & Gollwitzer, 2009, Study 3).

But do these postulated processes actually mediate implementation intention effects on goal attainment? There is supportive evidence for this assumption. In the Gilbert et al. (2009) study, the increased brain activity in the medial rostral prefrontal cortex matched the increase in prospective memory performance in participants who had formed implementation intentions. Moreover, studies by Webb and Sheeran (2007, 2008) found that the effects of if-then plans on goal attainment were mediated simultaneously by the accessibility of the specified situational cues and by the strength of the association between these cues and the intended response. The search for further mediating variables has shown that neither an increase in goal commitment nor an increase in self-efficacy qualifies as a potential alternative mediator of implementation intention effects.

Implementation intentions as a means to overcome typical challenges of goal striving. The effects of implementation intentions have been demonstrated in the educational, interpersonal, health, and environmental domains, with respect to each of the four challenges to effective goal striving: getting started, staying on track, and disengaging from futile and inappropriate goals, as well as avoiding resource depletion. With respect to the first problem, implementation intentions were found to help individuals *get started* with goal striving in terms of remembering to act and overcoming an initial reluctance to act (e.g., see summary by Gollwitzer & Oettingen, 2011). Accordingly, it seems safe to assume that if-then plans can be used effectively to help students and teachers fight procrastination (e.g., getting started with homework or getting started with grading students’ homework: Wieber & Gollwitzer, 2010).

However, many goals cannot be accomplished by a simple, discrete, one-shot action because they require people to keep striving over an extended period of time. *Staying on track* may then become very difficult when certain internal stimuli (e.g., being nervous) or external stimuli (e.g., distractions) interfere with the ongoing goal pursuit (e.g., going to bed that guarantees a satisfying sleep: Loft & Cameron, 2013). With respect to shielding an ongoing goal pursuit from inside stimuli, implementation intentions were

demonstrated to be effective with respect to performance anxiety (Achtziger, Gollwitzer, & Sheeran, 2008), test anxiety (Parks-Stamm, Gollwitzer, & Oettingen, 2010), social anxiety (Webb, Onanaiye, Sheeran, Reidy, & Lavda, 2010), as well as general anxiety (Varley, Webb, & Sheeran, 2011). Implementation intentions have also been demonstrated to be effective in shielding goal pursuit from outside stimuli. For instance, they helped college students who were trying to solve math problems to shield themselves from distractive video clips (“If I see moving pictures or hear some noise, then I’ll ignore them!”: Gollwitzer & Schaal, 1998). Analogous findings were obtained with children of 6–8 years of age (Wieber, Suchodoletz, Heikamp, Trommsdorff, & Gollwitzer, 2011). Ignore-implementation intentions were highly effective in a classification task (categorizing vehicles vs. animals, presented on a computer screen), even when the distractions were highly attractive (i.e., cartoon movie sequences), and no matter whether these distractions appeared inside or outside the children’s sight.

Implementation intentions may use different formats. For instance, if a student wants to keep studying even though the students next to her start a loud conversation, she can form suppression-oriented implementation intentions, such as “And if the students around me get noisy, then I will not get upset!” The then-component of such suppression-oriented implementation intentions negated the critical behavior (in the present example “then I will not get upset”). However, it may also specify a replacement behavior (“. . . , then I will stay calm and ask them in a friendly manner to be more quiet!”) or focus on ignoring the critical cue (“. . . , then I will just ignore the noise!”). Recent research (Adriaanse, van Oosten, de Ridder, de Wit, & Evers, 2011) suggests that “negation” implementation intentions are less effective than the latter two types (i.e., replacement and ignore implementation intentions). Implementation intentions specifically geared towards stabilizing the ongoing goal striving are particularly effective (e.g., using if-then plans that explicate in detail what needs to be done to reach the goal; Bayer et al., 2009). In fact, it even blocked the disruptive effects created by inappropriate moods, ego depletion, or feelings of insecurity.

Goals or means that are no longer feasible and/or desirable in their current form may require individuals to adjust goal striving and to *disengage* from a goal or a chosen means to achieve that goal. Such disengagement from unattainable goals or dysfunctional means can free up resources and minimize negative affect resulting from repeated failure feedback (Carver & Scheier, 1998; Locke & Latham, 1990, 2006). Implementation intentions help to master this third challenge of effective goal pursuit (i.e., *functional disengagement*) by: (a) specifying negative feedback as a critical cue; and (b) linking this cue to switching to an alternative goal or means (e.g., a different way of studying for an academic test; Henderson, Gollwitzer, & Oettingen, 2007).

Finally, regarding the fourth challenge of effective goal pursuit, *not overextending oneself*, forming implementation intentions prevents resource depletion. Specifically, it enables individuals to engage in automated goal striving. As a

consequence, the self should not become depleted (Muraven & Baumeister, 2000) when goal striving is regulated by implementation intentions. Indeed, in studies using different ego-depletion paradigms, research participants who used implementation intentions to self-regulate in one task did not show reduced self-regulatory capacity in a subsequent task (e.g., switching from one academic task to the next; Webb & Sheeran, 2003).

When effective goal striving gets particularly hard. The following three situations ask for more powerful self-regulation: (a) situations in which a person’s knowledge and skills constrain performance, such as having to solve difficult math problems; (b) situations in which a competitor limits one’s performance, such as competitive sports; and (c) situations in which the wanted behavior (e.g., paying attention in class) conflicts with established habits favoring an antagonistic response (e.g., chatting with one’s classmate). For all three of these situations, implementation intentions turned out to be beneficial.

Implementation intentions were found to enhance participants’ performance on the Raven intelligence test, which consists of a series of problems to be solved (Bayer & Gollwitzer, 2007). The implementation intention “If I start a new problem, then I will tell myself: I can do it!” was more effective than the respective goal intention “I will tell myself: I can do it!” Tennis players participating in competitive tennis tournaments using implementation intentions effectively coped with critical situations during the game (e.g., “If I’m falling behind, then I’ll tell myself: Stay concentrated!”; Achtziger et al., 2008).

Finally, assuming that action control by implementation intentions is immediate and efficient, a horserace model of action control suggests that implementation intentions can be used to deal with antagonistic habitual responses (Adriaanse, Gollwitzer, de Ridder, de Wit, & Kroese, 2011). Implementation intentions that specify responses contrary to the habitual responses (Cohen, Bayer, Jaudas, & Gollwitzer, 2008), have been shown to effectively reduce habitual responses, such as stereotyping (e.g., “When I see the face of someone who looks different from me, then I will think ‘safe!’”; e.g., Gollwitzer & Schaal, 1998; Mendoza, Gollwitzer, & Amodio, 2010; Stewart & Payne, 2008).

Still, forming implementation intentions may not always succeed in blocking habitual responses. Whether the habitual response or the if-then guided response will “win the race” depends on the relative strength of the two behavioral orientations (Webb, Sheeran, & Luszczynska, 2009). This implies that controlling strong habits requires the formation of strong implementation intentions (e.g., trying to break the bad habit of watching TV when one gets home from school by an if-then plan to first do one’s homework). Forming strong implementation intentions can be achieved by various measures. One pertains to creating particularly strong links between situational cues (if-component) and goal-directed responses (then-component) by asking participants to use mental imagery (e.g., Knäuper, Roseman, Johnson, & Krantz, 2009). Also, certain formats of implementation

intentions (i.e., replacement and ignore implementation intentions) seem to be more effective in fighting habits than others (i.e., negation implementation intentions), and some formats seem to work better for some people than others (e.g., test-anxious individuals particularly benefit from ignore implementation intentions; Parks-Stamm et al., 2010). Finally, one has to keep in mind that behavior change cannot only be achieved by breaking old habits; one can also form new habits in new situational contexts (e.g., doing one's homework in the library before one goes home).

Moderators of implementation intention effects. Recent research has identified a number of moderators of implementation intention effects on goal attainment. First, implementation intentions only benefit goal attainment when commitment to both the goal is high (Sheeran, Webb, & Gollwitzer, 2005) and to executing the implementation intention is high (Achtziger et al., 2012, Study 2). Second, person attributes play a role. In undergraduate students (Webb, Christian, & Armitage, 2007), attendance in class was studied as a function of conscientiousness, openness to experience, goal intentions, and implementation intentions. Increased class attendance due to planning occurred only for low/moderately conscientious students as high conscientious students showed a perfect class attendance to begin with. This finding is in line with the repeated observation (Gollwitzer & Sheeran, 2006) that implementation intention effects are stronger when used for difficult rather than easy goals.

Moreover, implementation intention effects do not seem to depend on a person's lack of self-regulatory capacity (i.e., executive control resources; Hall, Zehr, Ng, & Zanna, 2012). It comes as no surprise then, that implementation intentions have been found to benefit children with attention deficit hyperactivity disorder (ADHD). According to the dual-pathway model (Sonuga-Barke, 2002), ADHD impairs behavioral control in two ways: (a) through an inhibitory dysfunction leading to poor task engagement and inattentiveness; and (b) through a deregulation of reward mechanisms leading to a higher preference for immediate rewards. Children with ADHD benefit from forming implementation intentions by improving both functions (e.g., Gawrilow & Gollwitzer, 2008; Gawrilow, Gollwitzer, & Oettingen, 2011a) as well as their ability to delay gratification (Gawrilow, Gollwitzer, & Oettingen, 2011b).

Summary. Forming implementation intentions is a volitional strategy that links cognitive, affective, or behavioral responses that are instrumental to reaching desired outcomes to critical situational cues. As a consequence, when the critical situation is encountered, the specified response is executed immediately, effortlessly, and without conscious intent. If-then planning can thus be understood as a self-regulation tool that allows for strategically delegating one's action control to critical situational cues.

There are two new lines of implementation intention research (see Gollwitzer, 2014) that are of relevance to improving the cooperation, communication, and interaction between students, teachers, and administrators. The first

pertains to the use of implementation intentions in groups. This research asks whether individual group members can use implementation intentions to promote collaboration and thus improve group performance, and whether groups can also use we-implementation intentions ("If we encounter . . . , then we will . . . !") to promote group performance. The second new line of implementation intention research explores whether if-then plans can be used to benefit communication and social interaction. For instance, one question is whether implementation intentions can boost interest in sustained contact and close interpersonal distance in anxiety-provoking interactions (e.g., interracial interactions).

Mental Contrasting with Implementation Intentions as a Metacognitive Intervention

The two volitional strategies of mental contrasting and implementation intentions have been combined to form a strategy called *mental contrasting with implementation intentions* (MCII). MCII is found to be more effective in changing behavior than each of the two alone, as the two strategies support each other. As mental contrasting of feasible wishes strengthens the non-conscious association between reality and instrumental means (Kappes et al., 2012; Oettingen, 2012), explicitly forming implementation intentions strengthens this association even further. Mental contrasting in turn benefits the effects of implementation intentions. Specifically, it prepares the application of implementation intentions in two ways: (a) Mental contrasting of feasible wishes fosters goal commitment and energization, and goal commitment is a necessary prerequisite for implementation intentions to be effective (Sheeran et al., 2005); and (b) in mental contrasting the idiosyncratic obstacles and means to pursue the desired future are specified, so that the obstacle can work as the if-component of a given implementation intention, and the instrumental means as the then-component. In sum, *if-then* plans as part of MCII may look like: "If . . . (obstacle), then I will . . . (respond to overcome or circumvent the obstacle)."

MCII is more effective than MC and II alone. MCII has been found to be more effective than mental contrasting and forming implementation intentions alone (Adriaanse et al., 2010; Kirk, Oettingen, & Gollwitzer, 2013; see summary by Oettingen, 2012). For example, MCII helped college students more in breaking snacking habits than mental contrasting only and forming implementation intention only. Importantly, mental contrasting did increase perceived clarity about personal obstacles towards reducing unhealthy snacking. These findings suggest that MCII may also be a valid strategy for fighting bad habits in educational settings (e.g., procrastination).

What underlying processes make MCII so effective for behavior change? Mental contrasting creates clarity about one's personal obstacles which can then be used as critical cues in the formation of implementation intentions (e.g., if my friends call, then I will tell them that I need to do my homework). Indeed, when Adriaanse, de Ridder, and de Wit

(2009) compared the effectiveness of if-then plans that were personalized vs. kept general (i.e., specifically referred to each participant's unique action control problem vs. a general action control problem), it was the personalized if-then plans that turned out to be more effective.

MCII improves academic performance in school-children. Duckworth, Grant, Loew, Oettingen, and Gollwitzer (2011) conducted an intervention study with university-bound high-school students preparing for the Preliminary SAT (PSAT) over the summer. Students first wrote down two positive outcomes they associated with completing all of the practice tests in the workbook (e.g. "I would feel good about myself"), and two obstacles of the present reality (e.g. "I'm distracted") that could interfere with this task. They then rewrote the previously stated first outcome, imagined it as vividly as possible, and then wrote their thoughts and images down. This procedure was repeated for the first obstacle, the second named positive outcome, and the second obstacle. Students then proposed a specific solution for each obstacle. Specifically, they completed two if-then plans in the following way: "If (obstacle), then I will (solution)." Finally, each student received a 12th edition of Barron's *How to prepare for the PSAT* workbook (Green & Wolf, 2004). These workbooks were collected in October, immediately after students had completed their PSAT. Students who applied MCII completed 60% more questions in their workbooks than control participants who had to write a short essay on an influential person or event in their life.

MCII also turned out to be helpful for the self-regulation of school-related concerns in middle-school schoolchildren at risk for ADHD (Gawrilow, Morgenroth, Schultz, Oettingen, & Gollwitzer, 2013). Students received a standard learning style or a learning style plus MCII intervention. The MCII pertained to students' most important school-related concern (e.g., be more attentive in French class). When parents rated their children's management of school-related activities (e.g., homework is done reliably, vocabulary is learned, desk is tidy) two weeks later, both children at risk and not at risk for ADHD benefited from MCII, more than from the learning style intervention. Importantly, the more ADHD symptoms the children showed before the intervention, the more they benefited from the MCII intervention.

Economically disadvantaged middle-school children participated in a further MCII study (Duckworth, Kirby, A. Gollwitzer, & Oettingen, 2013). Prior to the intervention, teachers were asked to rate children in their classroom behavior during the previous month. Baseline academic performance was assessed using three indicators from the official record: grade point average (GPA), attendance, and conduct. At the beginning of the third quarter, children were randomly assigned to complete either the MCII or a positive thinking control exercise. The children in both conditions targeted their most important personal wishes related to schoolwork. Trained interventionists met with the children in groups of four to five during three 1-hour sessions. After the third quarter, the three indicators of academic performance

(GPA, attendance, and conduct) were obtained again. Compared to children in the control condition, children that were taught how to apply MCII significantly improved their GPA, attendance, and conduct.

Summary. MCII is a volitional strategy that combines two effective self-regulation strategies. By mentally contrasting the desired future with the present reality, students, teachers, and administrators identify what in themselves holds them back from attaining what they would like to achieve in the future. If they deem their wished-for future as reachable, they become energized and actively pursue the desired future; if they deem it as futile they let go and turn to alternative pursuits. Forming implementation intentions on top of mental contrasting enables them to master even highly challenging obstacles. MCII is easy to apply and particularly effective for people with special needs, such as children at risk for ADHD and children of low socioeconomic background. Therefore, MCII qualifies as an effective volitional strategy that children, teachers, and administrators can use to better their everyday life and long-term development (for instructions of how to learn and apply MCII in students and during one's everyday life, see woopmylife.org. WOOP stands for wish outcome obstacle plan).

Individual Differences in Volition

The previous sections focused on understanding the processes underlying volition and respective behavior change interventions. But there are also individual difference perspectives on volition (see Corno, 2001, on habits). One line of research relates education outcomes to individual differences, such as the conscientiousness factor of the Big Five personality model, which encompasses dependability, punctuality, and orderliness (see Chapter 13, this volume; and McCrae & Costa, 1987). Another line (see Duckworth, 2009) distinguishes between two person-related attributes relevant to volition: grit and self-control.

Grit is defined as the tendency to sustain interest in and effort toward long-term goals; it is operationalized using the grit scale, a Likert-type self-report scale that includes items such as: "I am a hard worker" and "I finish whatever I begin." Self-control is defined as voluntary regulation of behavioral, emotional, and attentional impulses in the presence of momentarily gratifying temptations or diversions; it is operationalized using a scale with items such as: "My mind wandered when I should have been listening" and "I talked back to my teacher or parent when I was upset" (Duckworth & Carlson, 2013). Grit and self-control predict objectively measured performance over and above measures of talent. For instance, in longitudinal studies, grit predicts surviving the arduous first summer of training at West Point, reaching the final rounds of the National Spelling Bee, retention in the U.S. Special Forces, retention and performance among novice teachers, and graduation from Chicago public high schools. These predictions are observed after statistically adjusting for measures such as IQ, SAT, or standardized achievement test scores, as well as physical fitness scores.

In cross-sectional studies, grit correlates with lifetime educational attainment and, inversely, lifetime career changes and divorce.

Self-control predicts report card grades (and changes in report card grades over time) more strongly than measures of intelligence (Duckworth, Tsukayama, & May, 2010). Finally, recent research has looked at two distinct measures of academic performance—report card grades and standardized achievement test scores—and their different relations with self-control and intelligence. In three separate samples, self-control prospectively predicted changes in report card grades more accurately than intelligence scores, but intelligence was found to be a better predictor of changes in standardized achievement test scores (Duckworth, Quinn, & Tsukayama, 2012).

It is important to recognize that individual difference approaches to volition can easily be integrated into the process models described above. For instance, Webb et al. (2007) used an implementation intention intervention to help undergraduate college students to show up for class on time. They observed that only students low in conscientiousness benefited from the implementation intention intervention (as the students high in conscientiousness showed up on time to begin with). In other words, it was those students who had problems with showing up on time (i.e., the students who needed volition to overcome barriers to achieving the desired outcome of being punctual) who benefited from employing a self-regulation strategy.

While Webb et al. (2007) combine personality and process approaches to volition in terms of moderation of self-regulation processes by personality variables, there is also the possibility of combining the two approaches in terms of explicating distinct self-regulation processes for different types of people. This approach has been explored by Kuhl (1985) who differentiates individuals with an action orientation from those with a state orientation (i.e., individuals who show high vs. low cognition-behavior consistencies). His extensive empirical research (Kuhl, 2000; Kuhl, Kazén, & Koole, 2006) has by now delineated in detail what psychological processes (i.e., patterns of interactions among four cognitive systems: intention memory, extension memory, discrepancy-sensitive object recognition, and intuitive behavior control) ultimately lead to different levels of self-regulatory abilities.

Corno et al. (2002) suggest that studying individual differences in self-regulation across school settings might benefit from differentially looking at cognitive versus affective versus conative (motivational and volitional) individual differences (see also Corno, 2001). For example, with respect to affect, models may be developed for studying the influence of anxiety and mood on self-regulation; these influences may be moderated by temperament-related differences in reactivity and motivations, such as efficacy as well as problem- versus emotion-focused styles of coping with stress (Boekaerts, 1987; see also Folkman & Lazarus, 1985). Further, with respect to cognition, it might be worthwhile differentiating a deep approach to processing of information in learning situations versus a surface

approach (Entwistle, 1989) and investigating how these different approaches relate to grit and self-regulation. Finally, with respect to conation, one might want to investigate how students' work styles, such as detached and disengaged versus committed, hopeful, and engaged (Ainley, 1993), may determine to what extent students benefit from using various volitional strategies.

Conclusion and Future Research

One of the major challenges in education is to keep students striving for the attainment of future outcomes that are beneficial for them and for their context. A first step to master this challenge is to strengthen students' motivation by heightening both incentive value of academic achievement (desirability) and relevant expectations (feasibility). But in addition to the motivational processes that establish desirability and feasibility of academic goals, students need volition to ensure that they do not pull back from challenging tasks and long-term goals in the face of resistance and conflict (e.g., do not give up in math, or drop out of school). Volitional strategies like mental contrasting and forming implementation intentions, and especially the combination of the two, can help students reach attractive and attainable future outcomes by preparing themselves to master upcoming obstacles and setbacks. A big advantage of MCII is its simplicity. It can be taught as a metacognitive strategy in a very short time, and it can be applied during everyday life with relative ease. Importantly, students need no special skills or personal attributes to learn and apply MCII as it can be acquired by students of different walks of life and cultures, and used in diverse contexts to solve a wide array of different tasks.

Because MCII can be used for any wish and concern, it should benefit the mastery of the various challenges arising from the individual vulnerabilities described above. For example, referring to the example of a deep versus surface approach to information processing, it would be important to investigate whether MCII and other self-regulation strategies (e.g., goal shielding, distancing) can help students to flexibly adopt one mode of information processing versus another (Entwistle, 1989). Research might test whether teaching MCII to students would foster the surface approach when preparing for an upcoming test, especially when there is only a short time left to study. In contrast, for learning basic skills that a student needs in order to build a career in a particular field (e.g., basics in physics for a student aspiring to attend graduate school), MCII should promote adopting a deep approach. By allowing the student to fully understand which future she wishes for and which of her own obstacles are in the way, MCII will provide clarity whether surface or deep information processing is called for.

Similarly, future research may investigate MCII or other self-regulation procedures in the context of the dual processing self-regulation model (Boekaerts & Niemivirta, 2000). Specifically, MCII might readily support the growth pathway (top-down process of goal achievement) as the wished-for future in this case pertains to an improvement of the status quo. In the well-being pathway, students focus on

preventing negative futures. Here the desired future pertains to keeping the status quo (“How nice would it be if I kept my GPA high?” or “How nice would it be if I continued to have a close relationship with my teacher?”). Alternatively, students could be asked to mentally contrast a potential negative future (e.g., “I might upset my teacher”) with the positive reality that they might lose (e.g., the close relationship to the teacher right now), so that the students commit to preserving the valuable present reality. Such mental contrasting instills avoidance (rather than approach goals, e.g., Oettingen, Mayer, & Thorpe, 2010b), which may be particularly helpful in educational settings whenever the well-being path is concerned and when emotion regulation is called for.

Finally, Corno et al. (2002) have noted that the research in education has not focused enough on hypotheses of how affect and conation relate to cognition. Our own research investigating self-regulation strategies may be seen as a step in that direction. Research on MCII addresses the regulation of cognition (e.g., stereotypic or schematic thinking), emotion (e.g., anxiety, anger), and behavior (effort, performance). Indeed, applying MCII to a particular wish (e.g., being more friendly to a teacher) will have downstream consequences benefiting all three areas—cognition (e.g., interpreting the teacher’s behavior in a more friendly light), emotion (e.g., feeling better after interacting with the teacher), and conation (e.g., using a more respectful tone of voice when talking to the teacher). Finally, engaging in MCII entails procedures that involve all three pathways. It instigates cognition (e.g., mental associations outside of awareness), emotions (e.g., feelings of energy; anticipated disappointment), and behavior (e.g., fighting back in light of setbacks) that mediate changes in observable performance and actual success. Future research should also focus on how these pathways interact when it comes to long-term consequences of MCII (e.g., to what extent do changes in emotion predict changes in performance, or the other way around).

In the present chapter, we defined volition and discussed respective processes that help to face resistance and resolve conflict in goal pursuit and behavior change. We also identified effective volitional strategies that students can learn and then apply on their own. These strategies support students, teachers, and administrators in identifying what they really want in the future and what kinds of obstacles stand in their way; they also help individuals to make plans and to ultimately overcome these obstacles. Importantly, for theory and research, these volitional strategies build on existing incentive values and expectations of success, thereby translating motivation into behavior change and goal attainment.

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