Abstract

We start out with describing how the goal concept emerged in the history of the psychology of motivation to better understand the important role it plays in current research on motivation. We then suggest a differentiation between studies targeting the setting of goals versus the implementation of goals to get a grip on the host of empirical work the goal concept has triggered. With respect to goal setting, we first discuss studies that explore determinants affecting the content and structure of set goals (e.g., entity vs. incremental theories of intelligence influence the setting of performance vs. learning goals). We then turn to studies on the self-regulation of goal setting and discuss in detail how a self-regulation strategy called mental contrasting of future and reality facilitates strong commitment to feasible goals but dissolves commitment to unfeasible ones. With respect to goal implementation we first refer to studies on the determinants of effective goal striving (e.g., the framing of the set goal in terms of approach vs. avoidance) and then turn to analyzing the effective self-regulation of goal implementation. Here we focus on the strategy of forming implementation intentions (i.e., if-then plans) and explicate in detail how such planning helps in overcoming classic hurdles to goal attainment (e.g., distractions). We will end the chapter by reporting the results of recent intervention studies that successfully enhanced goal attainment in the health, academic, and interpersonal domains by combining the self-regulation strategy of mental contrasting with that of forming implementation intentions.

Key Words: goal setting, goal implementation, goal commitment, obstacles, mental contrasting, implementation intentions, self-regulation, self-control, willpower, behavior change interventions

It is Friday afternoon. On Monday, there is an important presentation you have to give. Even though you are highly motivated to give a great talk (i.e., desirability and feasibility are high), you did not find the time to prepare the talk during the week. So you set yourself the goal to use the weekend to prepare a nice presentation. But how do you arrive at a strong commitment to attain this goal? And how do you ensure that you will indeed implement your goal? In the present chapter we will discuss research on self-regulation strategies that benefit (a) committing to goals and (b) implementing goals that one wants to attain (i.e., one feels committed to).

Goals Versus Motivation

The term motivation is commonly used to explain why a person in a given situation selects one response over another or makes a given response with great energization or frequency. Imagine a person looking for someone else in a crowd. She gets excited when she finds that person, and then she runs toward him. Each of these responses involves motivation, which can manifest itself cognitively (e.g., looking), affectively (e.g., excitement), and behaviorally (e.g., running). To the question of what drives motivation, the history of the psychology of motivation has offered ever more sophisticated answers.
Based on learning theory advanced by early animal psychologists (Hull, 1943; Spence, 1956), the strength of the tendency to make a response was at first considered to be a function of an organism’s skills (or habit strength), its needs, and the incentive value of the desired outcome. For example, how fast an animal runs toward a box containing food depends on its habit strength, its hunger, and the quality and quantity of food. However, with the advance of the cognitive revolution in psychology, these determinants of motivation as well as the concept of motivation itself became more elaborated. Tolman (1932) postulated various mental processes “which intermediate in the causal equation between environmental stimuli and . . . overt behavior” (Tolman, 1932, p. 2). These intermediate processes entailed concepts of purpose (ends and means) as well as expectations (e.g., means-expectations, end-expectations, and means-end-expectations). A few years later, Festinger (1942) and Atkinson (1957) drew on that work in their research on what motivates humans to select and perform tasks of varying difficulty. They suggested that people weight the incentive value of the desired outcome with the expectancy that it would actually occur.

Social cognitive learning theorists (e.g., Bandura, 1977) went a step further, factoring in whether one could successfully perform the necessary behavior required to arrive at a desired outcome (so-called efficacy or control beliefs). These theorists also alluded to further relevant expectations, such as whether the situation by itself would produce the desired outcome (Heckhausen, 1977; Mischel, 1973), whether performing a given behavior would lead to the desired outcome (Bandura, 1977), whether achieving the desired outcome would be instrumental to accruing further positive consequences (Vroom, 1964), whether the desired outcome could be brought about somehow by one’s actions (Oettingen, 1996), and whether the future in general would be bright (Abramson, Seligman, & Teasdale, 1978; Scherl & Carver, 1987).

Adding these expectancy-related variables helped to explicate in more detail the can-aspect (or feasibility aspect) of the motivation to make a certain response: Can the desired outcome be brought about? But the cognitive revolution also helped to explain the want-aspect (or desirability aspect) of the motivation to make a certain response: Do I really want the desired outcome? This desirability issue was originally captured by Hull (1943) and Spence (1956) as the concept of need and the concept of incentive. With respect to need, the cognitively inspired psychology of motivation ventured into the concept of motives (for a summary, see McClelland, 1985a), defined as the class of incentives that a person finds attractive (e.g., achievement, power, affiliation, intimacy). More important, McClelland (1985b) discovered that depending on whether this preference for certain classes of incentives was measured implicitly (as assessed by the Thematic Apperception Test; TAT) or explicitly (as assessed by attitude questionnaires), it predicts the execution of different types of motive-related responses: actions people spontaneously engage in versus actions people decide to engage in after thoughtful deliberation.

It was also found that whether an incentive is hoped for versus feared matters. For instance, a person with a strong achievement motive, longing for the pride associated with success, will choose a task of medium difficulty to pursue; this level of difficulty provides the most information about achievement level. However, a person who abhors the shame associated with failure (Atkinson, 1958) will choose either a very easy or a very difficult task, which is an effective strategy to avoid shame (as very easy tasks are likely to be solved, and failure on too-difficult tasks can easily be explained). Finally, researchers have differentiated among types of incentives as well (Heckhausen, 1977). For instance, in the realm of achievement, anticipation of positive self-evaluations (e.g., “I did really well”), positive evaluations by others (e.g., praise by the teacher), higher order positive consequences (e.g., successful professional career), and consequences that go beyond achievement (e.g., having a good time with coworkers) can all motivate people to do well on given tasks.

Given this increasing differentiation in thinking about the determinants of motivation (i.e., needs, incentives, and expectancies), one may wonder whether the concept of goals is at all needed. In our opinion, the concept of goals helps the cognitive explication of the readiness to make a certain response. Importantly in this regard, Ajzen and Fishbein (1969) suggested that this readiness should be assessed in terms of a person’s intention to make the response. Mischel (1973) went a step further and argued that such intentions can be conceived as self-imposed or assigned goals that imply standards that the person intends to meet (with respect to quality and quantity criteria). Doing so allows
asking new questions such as how people arrive at their goals and how they strive to achieve them. Noticing the unique nature of both of these problems, Kurt Lewin (Lewin, Dembo, Festinger, & Sears, 1944) suggested adopting a distinct theoretical perspective for goal setting versus goal striving. Present-day researchers have rediscovered Kurt Lewin's approach (see, e.g., the action phases model; Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987). Today, research on goals explicitly targets either the determinants and processes of goal setting or the determinants and processes of goal striving and successful goal attainment. In the subsequent discussion of current research on goals, we will therefore group the presented research into goal setting versus goal striving (goal implementation).

**Goal Setting**

**Determinants of Goal Content and Structure**

Most theories addressing the issue of goal setting focus on the question of what goals people are setting themselves: What types of contents and what type of framing is preferred? With respect to content, the perceived desirability and feasibility of the goal matters. Perceived desirability is high when the goal is in line with the person’s needs (e.g., needs for autonomy, competence, and social integration; Hagger, Chazis, & Harris, 2006; Ryan, Sheldon, Kasser, & Deci, 1996), wishes (e.g., possible selves; Oyserman, Bybee, & Terry, 2006), higher order goals (e.g., identity goals; Gollwitzer & Kicha, 1998), and attitudes (i.e., the expected value of achieving the goal at hand; Ajzen & Fishbein, 1980). But perceived feasibility also matters. As suggested by Bandura (1997), feasibility concerns play an important role in setting goals of certain contents as well. It matters whether people feel that they can make the responses that produce the desired goal. Self-efficacy beliefs need to be high (or control beliefs as referred to by Ajzen, 1991, in his theory of planned behavior) for strong intentions (goal commitments) to emerge.

Recent research has turned its focus on the question of what makes people reflect on the desirability or feasibility (or both) of a given goal choice. For instance, Epstein and Rose (2008; McCrea, 2008) observed that failing to reach a set goal (e.g., not doing well in a midterm exam where one set out to receive an A) triggers thoughts such as: “If only I had studied harder, I would have done better on the midterm exam!” Such counterfactual thought in turn triggers reflections on the desirability and feasibility of studying harder for the class, potentially leading to the goal to study harder for this class in the future.

It is important to recognize that goals of the same content can be framed in different ways. Accordingly, goal research has analyzed what makes people favor a certain framing over another. For instance, a person who wants to be a good student may frame the goal of doing well in class as either approaching good grades (earning As and Bs) or avoiding bad grades (no Cs and Ds). Whether approach or avoidance framing is chosen depends on various attributes of the person (e.g., the trait disposition of extraversion vs. neuroticism, Larson & Augustine, 2008; reward sensitivity vs. punishment sensitivity; Gray, 1994; their motive dispositions of hope for success versus fear of failure, Elliot, 1997, Gable, 2006).

A further framing variation pertains to promotion strategy goals versus prevention strategy goals (Higgins, 1997; Scholer & Higgins, 2008) as one may want to approach a desired end state either by promotion strategies (i.e., with eagerness) or prevention strategies (i.e., with vigilance). Equally, when one moves away from an undesired end state, one can also use either promotion strategies (eagerness) or prevention strategies (vigilance). The framing of strategy goals in terms of promotion versus prevention has been found to be a consequence of whether people construe their self either as an ideal self that they desire to be or as an ought self that they feel compelled to be: Ideal-self individuals prefer a promotion framing, whereas ought-self individuals favor a prevention framing.

Dweck (1996) has suggested a framing distinction between performance goals and learning goals. Goals in the achievement domain, for example, may either focus on finding out how capable one is (performance goals) or on learning from the task (learning goals). Molden and Dweck (2006) argue that implicit theories on the nature of ability determine the preference for performance versus learning goals. If people believe that ability is fixed and cannot be easily changed (i.e., hold an entity theory of ability), they prefer setting performance goals. However, if people believe that ability can be improved by learning (i.e., hold an incremental theory of ability), they prefer setting learning goals.

Another structural feature of goals is their level of abstractness. People generally prefer to set themselves abstract goals. They adopt concrete goals predominantly when they run into problems attaining
an abstract goal (see action identification theory; Vallacher & Wegner, 1987). Finally, goals of any content (e.g., solving a math problem, writing a book, getting to know a stranger) can be specified at different levels of difficulty. Which level is preferred depends on whether a person’s achievement motive is dominated by hope for success or fear of failure (Atkinson, 1957), whether the goal is made public (Hollenbeck, Williams, & Klein, 1989), and whether one has successfully achieved an earlier goal (Bandura, 1997).

Knowing the determinants of the content and structure of the goals people set themselves still does not answer the question of what people can do to promote strong goal commitments. Perceiving a goal as desirable and feasible does not guarantee that one actually commits strongly and then sets out to strive for this goal. For instance, one may wish to learn to play the violin because one loves to make music and feels capable of doing so (after all one knows how to sing well), yet actually committing oneself to realize this wish takes a further step, and there are certain self-regulatory strategies that facilitate making this step.

**Self-Regulation of Goal Setting**

Various mental strategies advance the transition from one’s wishes and fantasies to goal commitments. The theory of fantasy realization specifies three respective self-regulation strategies (Oettingen, 2000): mental contrasting, indulging, and dwelling. In mental contrasting, people first imagine the fulfillment of a wish or fantasy (e.g., giving a good presentation at a conference) and then reflect on the present reality that stands in the way of attaining the desired future (e.g., evaluating anxiety). Mental contrasting is a problem-solving strategy that makes people recognize that they have not yet fulfilled their wish and that they need to take action in order to achieve the desired future. As a consequence, expectations of attaining the desired future become activated and determine a person’s goal commitment and subsequent striving to attain the desired future. When perceived expectations of success are high, people will actively commit to realizing the desired future; when expectations of success are low, people will refrain from doing so, and thus they will venture on alternative wishes and desired futures. In this way, mental contrasting helps people discriminate between feasible and unfeasible goals.

The theory of fantasy realization specifies two further routes to goal setting. People may engage either in indulging (envisioning only the attainment of the wished-for future) or in dwelling (reflecting only on the present negative reality). Neither of these mental strategies produces any discrepancy between future and reality, and thus the individual fails to recognize that actions (making responses) are necessary to achieve the desired future. Therefore, expectations of success do not become activated, and goal setting does not reflect the perceived likelihood of reaching the desired future. Individuals who indulge and dwell show a medium level of goal commitment, even though the resource-efficient strategy to follow would be for no engagement in the case of low expectations of success, and full engagement in the case of high expectations of success. For example, when it comes to the goal of giving a good presentation at a conference, both an indulging and a dwelling person will show moderate preparation, regardless of whether a successful performance is perceived as within one’s reach or as hardly possible.

Various experiments support these claims (e.g., Oettingen, 2000; summary by Oettingen & Stephens, 2009). In one study (Oettingen, Pak, & Schnetter, 2001, Study 4), first-year students enrolled in a vocational school for computer programming indicated their expectations of excelling in mathematics. Next, they named positive aspects that they associated with excelling in mathematics (e.g., feelings of pride, increasing job prospects) and negative aspects of reality, that is, potential obstacles (e.g., being distracted by peers or feeling lazy). In the mental contrasting condition, participants had to elaborate in writing two aspects of the desired future and two aspects of present reality, in alternating order beginning with the aspect of the desired future. Participants in the indulging condition were asked to elaborate four aspects of the desired future only; in the dwelling condition they instead elaborated four aspects of the present reality only. As a dependent variable, participants indicated how energized they felt with respect to excelling in math (e.g., how active, eventful, energetic).

Two weeks after the experiment, the participants’ teachers reported how much effort each student had invested over the interim and provided each student with a grade for that time period. As predicted, only in the mental contrasting condition did the students feel energized, exerted effort, and earned grades based upon their expectations of success. Those with high expectations of success felt the most energized, invested the most effort, and received the highest course grades; those with low expectations of success felt the least energized, invested the least effort, and received the lowest course grades. To the contrary, participants in both the indulging and dwelling conditions felt moderately energized.
exerted medium effort, and received medium grades independent of their expectations of success.

A variety of studies pertaining to different life domains replicated this pattern of results, for example, experiments on studying abroad, acquiring a second language, getting to know an attractive stranger, finding a balance between work and family life, self-improvement, and fulfilling idiosyncratic interpersonal wishes of great importance (Oettingen, 2000; Oettingen, Höning, & Gollwitzer, 2000; Oettingen et al., 2001; Oettingen, Mayer, Thorpe, Janetzke, & Lorenz, 2005). Furthermore, strength of goal commitment was assessed by cognitive (e.g., making plans), affective (e.g., feelings of frustration), motivational (e.g., feelings of energization), and behavioral (e.g., amount of invested effort) indicators. These indicators were measured via self-report or observations, either directly after the experiment or weeks later. All of these studies evidenced the same patterns of results: Given high expectations of success, participants in the mental-contrasting group showed the strongest goal commitment; given low expectations, mental-contrasting participants showed least goal commitment. Participants who indulged in positive images about the future or dwelled on negative images of reality showed medium commitment no matter whether expectations of success were high or low. It is important to note that the outcomes of mental contrasting do not occur as a result of changes in the level of expectations (feasibility) or incentive valence (desirability) but rather as a result of the mode of self-regulatory thought (i.e., mental contrasting, indulging, dwelling), with mental contrasting aligning strength of goal commitment to expectations. Furthermore, the effects of mental contrasting depend on the person perceiving the present reality as an obstacle, that is, as standing in the way of realizing the desired future (Oettingen et al., 2001, Study 3). Thus, when mentally contrasting, people need to first elaborate the desired future and only then reflect on the present reality; the reverse order (reverse contrasting) fails to connect future and reality in the sense of the reality standing in the way of realizing the desired future outcome (Oettingen et al., 2001; A. Kappes & Oettingen, 2011).

The pattern of results, seen as a whole, shows that mental contrasting is a mode of thought that people can use to wisely regulate their goal pursuit. First, it helps people to build strong commitments to feasible desired future outcomes (i.e., high expectations of success); however, equally important, mental contrasting also fosters disengagement from unfeasible desired future outcomes (i.e., low expectations of success). Thereby mental contrasting allows people to orient themselves toward alternative, more promising endeavors and to actively search for new venues.

Recent research suggests that mental contrasting not only regulates goal setting and goal disengagement but also promotes the choice of suitable means for effective goal striving. Oettingen, Stephens, Mayer, and Brinkmann (2010) examined the mental-contrasting effects on seeking and giving help as means to an end. For college students, mental contrasting about attaining academic help (more than indulging and dwelling) led to expectancy-dependent commitment to seek help (Study 1), while for critical care nurses mental contrasting about helping patients’ relatives led to expectancy-dependent commitment to give help (Study 2). Thus, next to regulating commitment to goals, mental contrasting also regulates the selection of appropriate means to achieve goals.

Goal commitment instilled by mental contrasting equips people to successfully master negative feedback. A series of three studies (A. Kappes, Oettingen, & Pak, 2011; Oettingen & A. Kappes, 2009) shows that mental contrasting regulates the mastery of negative feedback in three different ways. When expectations of success were high, mental contrasting promoted the processing of relevant negative feedback, protected participants’ self-view of competence against negative feedback, and led to optimistic as well as effort-related (rather than ability-related) attributions in response to negative feedback. Thus, mental contrasting can be used as an effective strategy to strengthen goal commitment in the sense that it prepares people to master upcoming negative feedback.

So far, we reported findings about mental contrasting of a positive desired future with a negative present reality. However, mental contrasting does not have to pertain to the attainment of a positive future; people can also fantasize about a negative future and contrast fantasies about a negative feared future with reflection on the positive present reality. Oettingen, Mayer, Thorpe, Janetzke, and Lorenz (2005) observed in a group of xenophobic high school students that when negative fantasies (i.e., fears that social conflicts would arise from foreign youth moving into their neighborhood) are contrasted with reflections on a positive reality standing in the way of the feared future (i.e., youth having wonderful and exciting soccer matches with foreigners), mental contrasting produced expectancy-dependent goal commitments as well (i.e., more tolerance and the goal of approaching the foreigners by investing time and effort in welcoming them.
into one’s neighborhood). Thus, mental contrasting can be used to create approach goals that make people successfully conquer a feared future. In addition, Oettingen, Mayer, and Thorpe (2010) found that mental contrasting can also be used to create avoidance goals that make people successfully evade a feared future. In a study with chronic cigarette smokers, they found that setting oneself the goal of avoiding the feared consequences of smoking can be facilitated by mentally contrasting the feared future of negative health consequences with the current positive reality of still having a healthy body.

The mediating processes of mental contrasting pertain to both cognitive and motivational processes. As for cognitive processes, mental contrasting modulates the strength of the association between future and reality and between reality and instrumental means. In a series of four studies employing a primed lexical decision task to measure strength of association between future and reality, A. Kappes and Oettingen (2011) observed that when expectations of successfully reaching a desired future were high, mental contrasting strengthened the association between the desired future and the reality; when expectations were low, mental contrasting weakened future-reality associations. These results were obtained no matter whether expectations were measured or manipulated. Importantly, the future-reality associations in turn mediated mental contrasting effects on self-reported (e.g., feelings of responsibility) and other-rated goal commitment (e.g., raters scored quality of performance on giving a talk and solving a creativity test). Finally, mental-contrasting effects on future-reality associations vanished when participants were informed that the goal was achieved, implying that future-reality associations wax and wane with the upholding versus accomplishment of the goal that was generated by mental contrasting.

Mental contrasting not only links future and reality but also connects present reality to relevant instrumental means (i.e., means instrumental to overcome or circumvent the present reality to attain the desired future). In two studies, A. Kappes, Singman, and Oettingen (2011) showed that mental contrasting paired with high expectations established strong associations between present reality and instrumental behavior, whereas paired with low expectations of success, it weakened reality-behavior associations. Importantly, the strength of the reality-behavior associations mediated goal commitment as indicated by actual performance (e.g., performance of taking the stairs instead of the elevator to achieve the goal of getting physically fit).

Mediating processes of mental contrasting on goal commitment pertain also to motivational processes. Oettingen et al. (2009) investigated energization as a primary indicator of motivational processes. Specifically, they found that mentally contrasting a desired future with present reality leads to energization, which in turn creates goal commitments strong enough to lead to effective goal striving and successful goal attainment. Mediating effects of energization on goal commitment are shown on physiological indicators of energization (i.e., systolic blood pressure) as well as on experiential indicators (self-report of feeling energized). Mental contrasting also spurs various forms of planning, a known cognitive mediator between expectations of success and goal attainment (Oettingen et al., 2001, 2005; Oettingen & Stephens, 2009).

Finally, mental contrasting, as it is a problem-solving strategy, necessitates heightened cognitive activity. A recent experiment attesting to this idea used continuous magnetoencephalography (MEG), a brain imaging technique measuring magnetic fields produced by electrical activity in the brain (Achtziger, Fehr, Oettingen, Golwitzer, & Rockstroh, 2009). Mental contrasting as compared to indulging or simply resting produced heightened brain activity in areas associated with working memory, episodic memory, intention maintenance, action preparation, and vivid visualization. That is, mental contrasting implies vividly imagining a desired future, anticipating hindrances to realizing this future, and making plans on how to overcome these barriers. The brain activity associated with indulging, on the other hand, did not differ from resting.

Given this latter finding, one might think that indulging in the future could potentially lead to strong goal commitments as well—if only individuals managed to intensely engage in highly positive fantasies about the future. But research on engaging in positive versus negative fantasies about the future speaks against this argument. Early on, Oettingen and Wadden (1991) observed that obese women who spontaneously indulge in positive fantasies about their weight loss were less successful in achieving a lower body mass index (after 4 months and 2 years) than obese women whose spontaneously produced fantasies were more negative. Moreover, Oettingen and Mayer (2002) observed that people who indulge in positive fantasies (valence and frequency) show comparatively weaker goal commitments (as assessed by their efforts to strive for the goal) in the areas of academic achievement (i.e., achieving a good grade
in a psychology class), professional achievement (i.e., finding a job after graduation), interpersonal relations (i.e., finding a romantic partner), and health (i.e., recovering from hip surgery). Importantly, it did not matter whether the spontaneously produced positive fantasies pertained to the desired outcome or to the ways of getting there. Additionally, goal commitment on the assessment of the spontaneously produced positive future fantasies. More recently, H. B. Kappes and Oettingen (2011) investigated the effects of experimentally induced positive fantasies on energization, hypothesizing that low energy is a mechanism by which positive fantasies translate into poor achievement. Indeed, induced positive fantasies resulted in less energy (as measured by physiological and behavioral indicators) than fantasies that questioned the desired future, negative fantasies, or neutral fantasies. Additionally, energy measured right after the induction of the positive fantasies mediated accomplishment in everyday life a week later. Finally, positive fantasies yielded a larger decrease in energy when they pertained to a more rather than less pressing need (e.g., need achievement), further suggesting that it is the positivity of fantasies that quells energization. Altogether, the results indicate that one reason positive fantasies predict poor achievement is that they sap energy required to pursue the desired future.

At first sight, the reported findings seem to be in contrast to research observing facilitating effects of positive affect on performance in executive function tasks (Dreisbach & Goschke, 2004; Gable & Harmon-Jones, 2008; Kazen & Kuhl, 2005). However, these facilitating effects evince for individuals who perform tasks while being in a positive affective state. Note that in the studies reported earlier, it is not positive affect per se that is measured or manipulated, but the positivity of fantasies that depict the person already having attained the specified desired future. The mental experience of having already reached the desired outcome and of savoring the wished-for consequences reduces the energy required to reach the outcome in actuality. Only when such positive fantasies pertain to feasible futures and are mentally contrasted with the impending reality will people muster the energy to excel in actuality (Oettingen et al., 2009).

**Determinants of Goal Striving**

Goal content strongly affects the chances of implementing a goal successfully. For instance, Ryan et al. (1996) have argued that goals of autonomy, competence, and social integration favor creativity, cognitive flexibility, deep processing of information, and effective coping with failure. These effects are assumed to be mediated by an intrinsic self-regulation (see the self-concordance model by Sheldon & Elliot, 1999), as the needs of autonomy, competence, and social integration are associated with intrinsic goal striving in line with a person’s interests or core values, rather than with extrinsic goal striving in line with environmental pressures or internal sanctions. Intrinsic goal striving is preferred by individuals with positive self-regard (Judge, Erez, & Locke, 2005), and it can be facilitated from outside by teachers who provide autonomy support (e.g., when law school faculty provide autonomy support, grade point average improves; Sheldon & Krieger, 2007).

In addition to goal content, structural features of set goals also affect whether goal striving is successful. For example, goal striving is said to depend on the strength of the goal ("I really want to reach goal x"; Ajzen, 1991; Ajzen & Fishbein, 1980). But most tests of this goal-behavior relation involve only correlational studies that preclude causal inferences. A recent meta-analysis by Webb and Sheeran (2006) took a closer look at this assumption by selecting studies where the strength of the goal was manipulated relative to a control group, and differences in subsequent goal-directed behavior were observed. They found 47 experimental tests of the intention (goal)—behavior relation that actually used an experimental manipulation of the strength of
the goal (intention). The meta-analysis showed that the medium-to-large change in strength of intention \( (d = 0.66) \) led to a small-to-medium change in respective behavior \( (d = 0.36) \).

But success in goal striving does not only depend on the strength of the goal; it also depends on what kind of aspiration or standard is specified in the goal (i.e., whether the person wants to achieve a lot or only a little). Locke and Latham (2002, 2006) report that participants are more likely to attain challenging goals that are spelled out in specific terms than moderately specific goals or challenging but vague goals (i.e., “do your best”). This effect has a number of prerequisites: frequent performance feedback, strong goal commitment, low goal complexity, and that the necessary skills and means are available to the individual. What does not seem to matter is whether goal setting is determined from outside (assigned goals), freely chosen by individuals (self-set goals), or chosen in interaction with others (participative goals). As potential mediators of the goal-specificity effect, Locke and Latham point to heightened persistence, attention to the execution of goal-directed behaviors, a greater readiness to plan the goal pursuit, and to feedback and self-monitoring advantages.

Goal implementation is also affected by the structural features of time frame and goal orientation (i.e., approach vs. avoidance orientation, promotion vs. prevention, learning versus performance orientation, low versus high psychological distance, and low versus high identity-relationship). Note that the earlier discussion of goal setting pertained to what determines that a person sets goals with various structural features. Here we asked the question of what kind of consequences choosing one or the other structural framing has for successful goal attainment.

Framing of the orientation of social goals in terms of approach versus avoidance clearly affects their attainment. For instance, striving for the goal of making new friends versus striving for the goal of not being lonely produces quite different outcomes. With respect to the outcome variable of satisfaction with one’s social bonds versus loneliness, the latter leads to less favorable results than the former (Elliot, Gable, & Mapes, 2006; Strachman & Gable, 2006). Recent research suggests that these differences are mediated by differential attention and memory processes, differential interpretation and weighting of available information, and differential evaluation of the progress made toward goal attainment.

Higgins (2000; Försten, Higgins, & Idson, 1998; Shah, Higgins, & Friedman, 1998) reports that approach goals benefit more from goal striving that makes use of eagerness-related approach strategies (such as pulling things toward oneself) than from vigilance-related avoidance strategies (such as pushing things away from oneself), whereas the reverse is true for avoidance goals. The assumed reason for this is value from fit. Higgins (2006) argues that people engage more in goal striving when the strategies used match the goal orientation (i.e., eagerness strategies/positive outcome focus; vigilance strategies/negative outcome focus) than when there is a mismatch (i.e., vigilance strategies/positive outcome focus; eagerness strategies/negative outcome focus). This heightened engagement in turn leads to higher perceived value and strength of attraction to this outcome.

Framing goals in terms of learning versus performance has been found to have different effects on achievement (Dweck, 1996). Learning goals lead to better achievement than performance goals because the former allow for a more effective coping with negative feedback than the latter. For people with performance goals, negative feedback signals failure and lack of ability and thus causes them to give up prematurely. People with learning goals, on the other hand, view negative feedback as setbacks and as valuable cues on how to focus on new strategies, ultimately furthering goal attainment. Elliot and Church (1997) observed that performance goals are less detrimental when they are framed as approach goals (e.g., I want to get good grades) rather than avoidance goals (e.g., I do not want to get bad grades). Recent studies by Daron, Harackiewicz, Bufera, Mugny, and Quitmazde (2007), however, show that this is only true when the achievement context does not allow for the emergence of fear of failure (i.e., the task is easy; the feedback on one’s achievement is unambiguously positive). Recent research on the framing of achievement goals in terms of learning versus performance has also investigated its influence on interactions in social achievement situations (Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2007). People with learning goals are oriented reciprocally. They give information openly, and they process received information with a focus on those pieces of information that fit well and add value to their own chosen task strategy. On the other hand, people with performance goals are oriented exploitatively. They provide information to others reluctantly, and they process received information with a suspicious attitude that leads them to focus on detecting and disregarding low-quality information that might hurt their own task performance.
Another relevant structural feature is psychological distance. Liberman, Trope, McCrea, and Sherman (2007) had research participants indicate either why or how another person would perform an activity (e.g., open a bank account) and then ask them to guess when this person would enact the activity. As it turned out, why-contrasts of the activity revealed longer time estimates than how-contrasts. McCrea, Liberman, Trope, and Sherman (2008) recently assessed actual enactment times of intended activity (i.e., returning a filled-out questionnaire to the experimenter on time) that was framed in terms of high versus low psychological distance. Even though psychological distance was manipulated by a variety of different methods, low psychological distance led to earlier enactment of the intended activity than high psychological distance. It appears, then, that framing a goal in terms of high versus low psychological distance engenders the risk of procrastinating about the goal pursuit.

Finally, it matters whether a person frames a given task goal in terms of its identity-relatedness. For instance, the task of solving a certain arithmetic problem can be approached with the goal of solving it effectively or the goal of identifying oneself as a mathematician. The latter goal has been referred to as a self-defining goal or identity goal, as it specifies an identity as a desired end state. Self-completion theory (Wicklund & Gollwitzer, 1982) proposes that people who are committed to identity goals can undertake a variety of activities to claim identity-goal attainment, because many different behaviors indicate the possession of such identities. For a scientist, for example, such self-symbolizing activities might include engaging in professional duties (e.g., giving lectures), making positive self-descriptions (e.g., "I discovered a new principle!"), exerting identity-relevant social influence (e.g., advising students), or acquiring respective skills, tools, and material symbols (e.g., programming skills, fast computers, large office).

Failing to perform an identity-relevant activity or lacking an identity symbol produces a state of incompleteness; to restore completeness, people engage in self-symbolizing efforts (summary by Gollwitzer & Kirchhoff, 1998). People then emphasize the possession of alternative symbols or set out to acquire new identity symbols (e.g., engaging in identity-relevant activities, Brunstein & Gollwitzer, 1996; describing oneself as having the required personality attributes, Gollwitzer & Wicklund, 1985; showing off relevant status symbols, Harmon-Jones, Schmeichel, & Harmon-Jones, 2009). Importantly, affirming one’s general self-integrity or bolstering one’s self-esteem are not sufficient to offset incompleteness regarding an identity goal; rather, one must acquire specific identity symbols (Lederwood, Liviatan, & Carnevale, 2007).

Research on self-completion theory has discovered that a higher level of completeness is reached when a social audience notices the individual’s self-symbolizing activities (Gollwitzer, 1986). In addition, incomplete individuals are more concerned with finding an audience for their identity strivings than are completed individuals (Brunstein & Gollwitzer, 1996). This self-symbolizing, however, has its costs. Self-symbolizing individuals see others only in terms of the potential to notice their compensatory efforts; thus, they lack social sensitivity (Gollwitzer & Wicklund, 1985). Most interestingly, when people make public their intention to acquire a certain self-definition indicator (e.g., when a person who wants to become a great student publicly utters the behavioral intention to enroll in an inspiring course), it turns out that actual efforts toward completion are reduced (Gollwitzer, Sheeran, Michalski, & Seifert, 2009). Apparently, when others take notice of a stated identity-relevant behavioral intention, the superordinate goal of claiming the identity is already reached, and thus performing the intended behavior becomes less necessary. This finding is in line with results of earlier self-completion studies; public, positive self-descriptions claiming the possession of an identity symbol produced the same sense of self-definition incompleteness as actual identity-relevant achievements (Brunstein & Gollwitzer, 1996; Gollwitzer, Wicklund, & Hilton, 1982).

Striving for a given goal does not only depend on the content of the goal and its structural features. It also depends on the context in which the person is situated. Recent research on context variables in goal striving differentiates various context variables that relate to the person's affective state, the array of competing action tendencies, and the power position of the goal striver.

For instance, Tice, Bratslavsky, and Baumeister (2001) focused on negative affect and observed that feeling emotionally distraught (i.e., having been asked to imagine that one has caused a traffic accident that killed a child) makes it difficult to follow through with goals of not eating unhealthy food or delaying gratification to attain better long-term rewards. Moreover, this emotionally negative state also intensifies procrastination; for example, people did not use the time provided to study.
an upcoming test. In all of these studies it appeared that the reason people did not act on their goals was simple; they felt that inaction would alleviate their negative emotional states.

Positive affect, on the other hand, has been observed to facilitate goal striving. Kazen and Kuhl (2005; Kuhl & Kazen, 1999) argue that even though decreases in positive affect make it easier to maintain an intention in working memory, it takes an increase in positive affect to facilitate the successful behavioral implementation of difficult intentions (e.g., to do well on the Stroop task). Tamir and Robinson (2007) report data suggesting that positive moods (measured or induced) are associated with selective attention to reward stimuli. Gable and Harmon-Jones (2008) observed that positive affect induced by imagining rewards (such as tasty desserts) reduced the breadth of attentional focus, which facilitates focusing on specific action tendencies and thus tenacious goal striving. Apparently, positive affect makes people focus on rewarding stimuli that in turn produce a narrowing of attentional focus that makes it easy to strive for the goal at hand.

Given that positive affect seems to foster goal striving on well-structured tasks (e.g., Stroop and task-switching paradigms), this does not imply that positive affect is beneficial to striving for all kinds of tasks. Complex and ill-defined tasks require that people anticipate potential obstacles and hindrances. This is easier when people experience negative affect. Not surprisingly then, for complex and ill-defined tasks, positive affect was found to be a hindrance rather than a facilitator of goal attainment (Markman, Lindberg, Kay, & Galinsky, 2007; Oettingen & Mayer, 2002; Taylor, Pham, Rokkin, & Armor, 1998). And people are found to prefer to be in negative emotional states if those states better facilitate goal striving: for instance, soldiers entering battle or football players during a game prefer an angry, aggressive (negative) mood rather than a relaxed, positive mood (Tamir, 2009).

The success of goal striving in situational contexts that are filled with powerful distractions depends on whether the individual is capable of shielding goal striving from these distractions. Accordingly, the analysis of the determinants of effective goal shielding has received much research attention recently. For instance, Shah, Friedman, and Kruglanski (2002) observed that high commitment to the focal goal facilitates goal shielding (measured in terms of reduced accessibility of a competing goal), whereas feeling anxious and sad hinders it. Moreover, when people consider the progress they have made toward the goal there is less goal shielding, as people open up to competing goals; this effect occurs even when people are told merely to intend to make progress in the future (Fishbach & Dhar, 2005). However, this negative effect of goal progress on goal shielding should only be expected if the goal-directed actions taken (or intended) are interpreted by the individual as completing the goal; if the action is instead interpreted as indicating a strong commitment to the focal goal, then improved goal shielding would be expected (Fishbach, Dhar, & Zhang, 2006; Koo & Fishbach, 2008). In line with this reasoning, Louro, Pieters, and Zeelenberg (2007) report on the basis of diary and experimental studies that the effects of perceived proximity to the goal are moderated by the experience of positive or negative goal-related emotions. That is, when the attainment of the focal goal is remote, positive emotions promote goal shielding, whereas negative emotions hinder it; in this case, positive emotions apparently indicate a feeling of high goal commitment. When closer to the goal, positive emotions decrease shielding of the focal goal, whereas negative emotions prompt increased goal shielding; here, positive emotions apparently indicate a feeling of high goal attainment.

Recently, researchers have focused on the contextual variable of being in a position of power versus being powerless. Power has been manipulated experimentally in several ways: Participants remember an incident in which they had power over someone or someone had power over them; they imagine or actually act in a powerful (manager, evaluator) or a powerless role (subordinate, worker); or power is primed outside of awareness (e.g., by having participants perform a scrambled sentences task using words related to having power—e.g., authority, dominate—or to lacking power—e.g., subordinate, obey). These studies have shown that not only do powerful (as compared to powerless) participants relate differently to people by treating them as a means to the attainment of their goals (i.e., objectivation; Gruenfeld, Inesi, Magee, & Galinsky, 2008); they also differ in the ways in which they strive for personal goals.

Guinote (2007) observed that people in power procrastinate less in pursuing their goals, they persist longer in the face of difficulties, they show more willingness to try out different strategies to attain the goal, and they more readily seize good opportunities to make goal-directed responses. In addition, they more readily recognize whether a given situation can be used to serve their goals and then allow suitable situations to guide their behavior
(Guinote, 2008). All of this appears to be facilitated by a change in executive functioning. Smith, Jostmann, Galinsky, and van Dijk (2008) report that powerful individuals are better than powerless ones at updating goal-relevant information (i.e., new information is monitored for goal relevance, and relevant information replaces old, irrelevant information in working memory). They are also better at inhibiting responses that may interfere with the present goal, and at planning by continuously switching between the main goal and respective subgoals. Finally, these “powerful” participants show less goal neglect (i.e., forgetting to strive for the goal; Kane & Engle, 2003) by actively maintaining the goal in working memory. Future research could profitably explore the extent to which these effects are mediated by heightened efficacy beliefs or control beliefs that may be stimulated by the power manipulations.

Self-Regulation of Goal Striving

The earlier discussion considered goal content and structure, as well as contextual variables (e.g., relative power) as determinants of successful goal striving and goal attainment. The self-regulation approach to goal striving, on the other hand, focuses on what the individual can do to master the problems inherent in goal striving. One very powerful strategy is planning out goal striving in advance. Gollwitzer (1993, 1999) has proposed a distinction between goal intentions and implementation intentions. Goal intentions (goals) have the structure of “I intend to reach Zi!” whereby Z may relate to a certain outcome or behavior to which the individual feels committed. Implementation intentions (plans) have the structure of “If situation X is encountered, then I will perform the goal-directed response Y!” Both goal and implementation intentions are set in an act of will: The former specifies the intention to meet a goal or standard; the latter refers to the intention to perform a plan. For instance, a possible implementation intention for the goal intention to eat healthy food could link a suitable situational context (e.g., one’s order is taken at a restaurant) to an appropriate behavior (e.g., asking for a low-fat meal). Whereas goal intentions merely specify desired end states (“I want to achieve goal Xi!”), the if-component of an implementation intention specifies when and where one wants to act on this goal, and the then-component of the plan specifies how this will be done. Implementation intentions thus delegate control over the initiation of the intended goal-directed behavior to a specified opportunity by creating a strong link between a situational cue and a goal-directed response.

Implementation intentions have been found to help people close the gap between setting goals and actually realizing these goals. Evidence that forming if-then plans enhances rates of goal attainment and behavioral performance has now been obtained in many studies on a whole array of different goals. A recent meta-analysis (Gollwitzer & Sheeran, 2006) involving over 8,000 participants in 94 independent studies revealed a medium-to-large effect size ($d = .65$; Cohen, 1992) of implementation intentions on goal achievement in a variety of domains (e.g., interpersonal, environmental, health) on top of the effects of mere goal intentions. This size of the implementation intention effect is noteworthy, given that goal intentions by themselves already have a facilitating effect on behavior enactment (Webb & Sheeran, 2006).

Research on the underlying mechanisms of implementation intention effects has discovered that implementation intentions facilitate goal attainment on the basis of psychological mechanisms that relate to the anticipated situation (specified in the if-part of the plan), the intended behavior (specified in the then-part of the plan), and the mental link forged between the if-part and the then-part of the plan. 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 (Gollwitzer, 1999). This heightened accessibility of the if-part of the plan has been observed in several studies testing this hypothesis by using different experimental paradigms: for example, lexical decision tasks, Webb and Sheeran (2004), Parks-Stam, Gollwitzer, and Oettingen (2007); dichotic-listening paradigm, Achtziger, Bayer, and Gollwitzer (in press; Study 1); and cued recall (Achtziger et al., in press, Study 2). There are even some studies showing that the heightened accessibility of the mental representation of critical cues as specified in an implementation intention mediates the attainment of the respective goal intention (e.g., Aarts, Dijkstra, & Midden, 1999). More recent studies indicate that forming implementation intentions not only heightens the activation (and thus the accessibility) of the mental representation of the situational cues specified in the if-component, it also forges a strong associative link between the mental representation of the specified opportunity and the mental representation of the specified response (Webb & Sheeran, 2007, 2008). These associative links seem to be quite
stable over time (Papiès, Aarts, & de Vries, 2009), and they allow for priming the mental representation of the specific response (the plan's then-component) by subliminal presentation of the specified critical situational cue (if-component) (Webb & Sheeran, 2007). Moreover, mediation analyses suggest that cue accessibility and the strength of the cue-response link together mediate the impact of implementation intention formation on goal attainment (Webb & Sheeran, 2007, 2008).

Gollwitzer (1999) suggests that the upshot of the strong associative (critical situation-goal-directed response) links created by forming implementation intentions is that—once the critical cue is encountered—the initiation of the goal-directed response specified in the then-component of the implementation intention exhibits features of automaticity, including immediacy, efficiency, uncontrollability, and redundancy of conscious intent. Evidence that if-then planners act quickly (Gollwitzer & Brandstätter, 1997, Experiment 3), deal effectively with cognitive demands (i.e., speed up effects still evidence under high cognitive load; Brandstätter, Lengfelder, & Gollwitzer, 2001), show uncontrolled attention to the specified cues (Wieber & Sassenberg, 2006), and do not need to consciously intend to act in the critical moment is consistent with this idea (i.e., implementation intention effects are observed even when the critical cue is presented subliminally; Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009).

The postulated and observed component processes underlying implementation intention effects (enhanced cue accessibility, strong cue-response links, automation of responding) mean that if-then planning allows people to see and seize good opportunities to move toward their goals. Fashioning an if-then plan thus strategically automates goal striving; people intentionally make if-then plans that delegate control of goal-directed behavior to preselected situational cues with the explicit purpose of reaching their goals. This delegation hypothesis has recently been tested by a functional magnetic resonance imaging (fMRI) study reported by Gilbert, Gollwitzer, Cohen, Oettingen, and Burgess (2009). In this study, participants had to perform a prospective memory task on the basis of either goal or implementation intention instructions. 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, Simons, Dumontheil, & Gilbert, 2005).

Support for the delegation hypothesis also comes from studies using critical samples—that is, individuals with poor self-regulatory abilities such as people with schizophrenia and people with substance abuse disorders (Brandstätter et al., 2001, Studies 1 & 2), people with frontal lobe damage (Lengfelder & Gollwitzer, 2001), and children with attention-deficit/hyperactivity disorder (ADHD; Gawrilow & Gollwitzer, 2008, Paul et al., 2007). For instance, Brandstätter et al. (2001, Study 1) assigned hospitalized opiate addicts under withdrawal the goal to write a short CV before the end of the day; half of the participants formed relevant implementation intentions (they specified when and where they would start to write what), and the other half (control group) formed irrelevant implementation intentions (when and where they would eat what for lunch). Eighty percent of the relevant implementation intention participants had written a short CV at the end of the day, whereas none of the participants with the irrelevant implementation intention succeeded in doing so.

Implementation intentions have also been found to benefit children with ADHD who are known to have difficulties with tasks that require response inhibition (e.g., Go/NoGo tasks). For example, it was observed that the response inhibition performance in the presence of stop signals can be improved in children with ADHD by forming implementation intentions (Gawrilow & Gollwitzer, 2008, Studies 1 & 2). This improved response inhibition is reflected in electrophysiological data as well (Paul et al., 2007). Typically, the P300 component evoked by NoGo stimuli has greater amplitude than the P300 evoked by Go stimuli. This difference is less pronounced in children with ADHD. Paul et al. (2007) found that if-then plans improved response inhibition and increased the P300 difference (NoGo—Go) in children with ADHD. Recently, Gawrilow, Gollwitzer, and Oettingen (2011a) observed that children with ADHD can use implementation intentions to support executive functions in addition to inhibition (i.e., set shifting and working memory).

Additional process mechanisms to the stimulus perception and response initiation processes documented in the findings described earlier have been explored. For instance, furnishing goals with implementation intentions might produce an increase in goal commitment or self-efficacy, which in turn
cause heightened goal attainment. However, this hypothesis has not received any empirical support. A recent meta-analysis on 66 implementation intention studies that assessed goal commitment or self-efficacy after the formation of if-then plans revealed negligible effects on both of these variables (Webb & Sheeran, 2008); accordingly, neither an increase in goal commitment nor self-efficacy qualifies as a potential mediator of implementation intention effects. Additionally, having to furnish their goals with implementation intentions may suggest to research participants that the experimenter wants them to do well on the goal at hand. However, when experimenter demand was checked in studies assigning goals versus implementation intentions, participants who performed the task goals at hand under these different instructions did not in felt experimenter demand (e.g., Schweiger Gallo, Keil, McCulloch, Rockstroh, & Gollwitzer, 2009; Kirk, Gollwitzer, & Carnevale, 2011). Finally, one might argue that implementation intentions have positive effects on goal attainment because they provide extra strategy knowledge. In fact, several studies have critically tested this idea by adding to the design a further goal condition in which the critical strategy information was provided as well. However, this condition never showed the beneficial effects on goal attainment observed in the respective implementation intention condition (e.g., Oettingen et al., 2000; Palayiwa, Sheeran, & Thompson, 2010; Webb, Oonautye, Sheeran, Reedy, & Lavda, 2010).

Research on the facilitating effects of forming implementation intentions on goal attainment has targeted all of the four major problems that are known to doom effective goal striving: getting started, staying on track, failing to call a halt to futile goal striving, and overextending oneself. Given that forming implementation intentions automates goal striving, people who form implementation intentions should actually have it easier when they are confronted with these four central problems of goal implementation. Indeed, numerous studies suggest that problems of getting started on one’s goals can be solved effectively by forming implementation intentions. For instance, Gollwitzer and Brandstätter (1997, Study 2) analyzed a goal intention (i.e., writing a report about how the participants spent Christmas Eve) that had to be performed at a time when people are commonly busy with other things (i.e., during the subsequent 2 days which are family holidays in Europe). Still, research participants who had furnished their goal intention with an implementation intention that specified when, where, and how one wanted to get started on this project were about three times as likely to actually write the report than mere goal intention participants. Other studies found that implementation intentions foster striving toward goals involving behaviors that are somewhat unpleasant to perform (e.g., to recycle, Holland, Aarts, & Langendam, 2006; and to engage in physical exercise, Milne, Orbell, & Sheeran, 2002), even though there is an initial reluctance to execute these behaviors. Moreover, implementation intentions were associated with goal attainment in domains where it is easy to forget to act (e.g., regular intake of vitamin pills, Sheeran & Orbell, 1999; attendance for cervical cancer screening, Sheeran & Orbell, 2000; the signing of work sheets by the elderly, Chasteen, Park, & Schwarz, 2001).

But many goals cannot be accomplished by a simple discrete one-shot action as they require that people keep striving over an extended period of time. Such staying on track may become very difficult when certain internal stimuli (e.g., being anxious, tired, overburdened) or external stimuli (e.g., temptations, distractions) interfere with ongoing goal pursuit. Implementation intentions can prevent the negative influence of interferences from outside the person (e.g., disruptions by attractive video shows; Gollwitzer & Schaal, 1998). For this purpose, implementation intentions may take very different forms. For instance, if a person wants to avoid being unfriendly to a friend who is known to make outrageous requests, she can form implementation intentions such as: “And if my friend approaches me with an outrageous request, then I will not respond in an unfriendly manner!” The then-component of suppression-oriented implementation intentions does not have to be worded in terms of not showing the critical behavior; it may also specify an alternative antagonistic behavior (“..., then I will respond in a friendly manner!”) or focus on ignoring the critical cue (“..., then I’ll ignore it!”). Recent research suggests that the negation implementation intention (“..., then I will not respond in an unfriendly manner”) is the least effective as it is associated with an ironic activation of the mental representation of the unwanted behavior (Adriaanse, Van Oosten, De Ridder, De Wit, & Evers, 2011). Interestingly, implementation intentions can be used to curb the negative effects not only of interfering external events but also of interfering inner states. Achtziger, Gollwitzer, and Sheeran (2008), for instance, report two field experiments concerned with dieting (i.e., reduce snacking; Study 1) and athletic goals (i.e., win a competitive tennis match; Study 2) in which
goals were shielded by implementation intentions geared toward controlling potentially interfering inner states (i.e., cravings for junk food in Study 1, and disruptive thoughts, feelings, and physiological states in Study 2).

An alternative way of using implementation intentions to protect ongoing goal striving from derailment is to form implementation intentions geared toward stabilizing the ongoing goal pursuit at hand (Bayer, Gollwitzer, & Achziger, 2010). Using again the example of a person who is approached by her friend with an outrageous request, let us assume that the person who is the recipient of the request is tired or irritated and thus particularly likely to respond in an unfriendly manner. If this person has stipulated in advance in an implementation intention what she will converse about with her friend, the interaction may come off as planned, and being tired or irritated should fail to affect the person’s behavior toward her friend. Bayer et al. (2009) tested this hypothesis in a series of experiments in which participants were asked to make plans (i.e., form implementation intentions) or not, regarding their performance on an assigned task. Prior to beginning the task, participants’ self-states were manipulated, so that the task at hand became more difficult (e.g., a state of self-definitional incompleteness prior to a task that required perspective taking; Gollwitzer & Wicklund, 1985; a good mood prior to a task that required evaluation of others stereotypically; Bless & Fiedler, 1995; and a state of ego depletion prior to solving difficult anagrams; Baumeister, 2000; Muraven, Tice, & Baumeister, 1998). The results suggested that the induced critical self-states negatively affected task performance only for those participants who had not planned out work on the task at hand via implementation intentions (i.e., had only set themselves the goal to come up with a great performance). Apparently, task performance (i.e., taking the perspective of another person, judging people in a nonstereotypical manner, solving difficult anagrams) does not suffer any impairment because of the respective detrimental self-states (e.g., self-definitional incompleteness, mood, and ego depletion) if performing these tasks has been planned out in advance via implementation intentions.

The self-regulatory problem of calling a halt to a futile goal striving (i.e., disengaging from a chosen but noninstrumental means or from a chosen goal that has become unfeasible or undesirable) can also be ameliorated by forming implementation intentions. People often fail to readily disengage from chosen means and goals that turn out to be faulty because of a strong self-justification motive (i.e., we tend to adhere to the irrational belief that decisions we have made deliberately must be good; Brockner, 1992). Such escalation effects of sticking with a chosen means or goal even if negative feedback on goal progress amounts and alternative means and goals are available are reduced effectively, however, by the use of implementation intentions. These implementation intentions only have to specify receiving negative feedback as the critical cue in the if-component and switching to available alternative means or goals as the appropriate response in the then-component (Henderson, Gollwitzer, & Oettingen, 2007).

Finally, the assumption that implementation intentions subject behavior to the direct control of situational cues (i.e., strategic automation of goal striving; Gollwitzer, 1999) implies that the person does not have to exert deliberate effort when behavior is controlled via implementation intentions. As a consequence, the self should not become depleted (Muraven & Baumeister, 2000) when task performance is regulated by implementation intentions, and thus for individuals using implementation intentions, not overextending themselves should become easier. Indeed, using different ego depletion paradigms, research participants who used implementation intentions to self-regulate in one task do not show reduced self-regulatory capacity in a subsequent task (e.g., Webb & Sheeran, 2003).

LACK OF WILLPOWER

A new line of research on implementation intentions has been stimulated by Aristotle's concept of akraia (lack of willpower). It is argued that any willful strategy of goal striving (such as if-then planning) has to prove itself under conditions where people commonly fail to demonstrate willpower. Three such conditions have been analyzed so far: (a) situations in which a person's knowledge and skills constrain performance such as taking academic tests, (b) situations in which an opponent's behavior limits one's performance such as negotiation settings, and (c) situations in which the wanted behavior (e.g., no littering) runs into conflict with habits favoring an antagonistic response.

The litmus test for any strategy to improve willpower is enhanced performance in a delay of gratification task. Children with impulse control deficits (i.e., children with ADHD) are known to have particularly pronounced problems with delaying gratifications. Accordingly, Gawrilow, Gollwitzer, and Oettingen (2011b) analyzed whether delay of
gratification can be facilitated by forming implementation intentions even in children with ADHD. A computer task was developed in line with the delay of gratification paradigms developed by Walter Mischel (1974) and Sonuga-Barke (2002)—waiting in the presence of a suboptimal cue to make money for a delayed optimal cue to make money led to a higher total amount of money earned. In two studies it was observed that the goal intention to do well on the task did not improve performance as compared to a control group that received mere task instructions specifying the reward contingencies. However, when the goal intention was furnished with an implementation intention that linked a waiting response to the suboptimal cue, a significantly higher amount of money was earned, indicating a heightened ability to delay gratification.

Willpower is also called for when working on academic performance tests (math tests, general intelligence tests) as a good performance is commonly not only determined by a person’s knowledge, analytic capability, and cognitive skills but also by a person’s motivation to do well as a consequence of perceived desirability and feasibility of successful test performance. To increase test scores on the spot by exerting willpower, a person may thus focus on holding up her motivation (e.g., by increasing her self-efficacy feelings). Accordingly, Bayer and Gollwitzer (2007, Study 2) tested whether it is possible to increase self-efficacy beliefs by forming implementation intentions. They asked college students to take the Raven Intelligence Test: One group of participants formed a mere goal intention to do well (“I will correctly solve as many test items as possible”), whereas the implementation intention group added the following if-then plan: “And whenever I start a new test item, then I’ll tell myself: I can solve it!” Participants in the implementation intention condition performed better than those in the mere goal intention to perform well condition; implementation intention participants also performed better than participants in a further condition where a self-efficacy strengthening goal intention had to be performed (“I will tell myself: I can do these test items!”).

Often our goals are constrained by others who are competing with us for positive outcomes or have competing goals for the use of the situation at hand. In such competitive situations exerting willpower involves effectively protecting one’s goal striving from the unwanted influences generated by the goals of others (e.g., Martin, Sheeran, Slade, Wright, & Dibble, 2009). In their negotiation research, Trötschel and Gollwitzer (2007) targeted the sharing of a common good and explored whether the self-regulation strategy of forming implementation intentions enables negotiators to find agreements even if they have to operate under the adverse conditions of a loss frame (i.e., participants see how many points they lose rather than win and thus they are reluctant to make concessions; e.g., Bottom & Studt, 1993). When looking at the agreements achieved (i.e., level of joint outcomes), it was observed that pairs of loss-frame negotiators with a prosocial goal intention managed to somewhat reduce the resistance to concession making arising from the loss-frame negotiation context, but that only negotiators who furnished their prosocial goal intentions with respective implementation intentions were successful in completely abolishing the negative impact of the loss-frame negotiation context (i.e., showed a negotiation performance that was not different from that of gain-frame negotiators). In addition, action control via implementation intentions was found to be very efficient (i.e., implementation intentions abolished the negative effects of loss framing by leaving the negotiators’ cognitive capacity intact); negotiators who had formed implementation intentions were more likely to use the cognitively demanding integrative negotiation strategy of logrolling (i.e., making greater concessions on low rather than high priority issues). More recent negotiation research by Kirk, Gollwitzer, and Carnevale (2011) used a different negotiation task: the ultimatum game. The participants acted as receivers of a series of fair but also unfair offers. It is commonly found that impulsive anger in response to unfair offers leads to rejections—and in turn to a financial cost to the receiver. It was found that entering the ultimatum game with goals to make a personal profit only then curbed impulsive rejections by increasing the frequency of accepting unfair offers when these goals were furnished with respective implementation intentions.

The self-regulation of one’s goal striving becomes particularly difficult when habitual responses conflict with initiating and executing the needed goal-directed responses instrumental to goal attainment (e.g., Wood & Neal, 2007). In such cases, showing willpower means asserting one’s will to attain the chosen goal against unwanted habitual responses. But can the self-regulation strategy of forming if-then plans help people to let their goals win out over their habitual responses? By assuming that action control by implementation intentions is immediate and efficient, and adopting a simple horse race model of action control
(Gurney, Prescott, & Redgrave, 2001a, b), people might be in a position to break habitualized responses by forming implementation intentions (e.g., by forming if-then plans that spell out a response that is contrary to the habitualized response to the critical situation; Holland, Aarts, & Langendam, 2006).

Research on the control of automatic responses by implementation intentions has targeted cognitive, affective, and behavioral responses. With respect to cognitive responses it has been shown that automatic cognitive biases such as stereotyping can be successfully controlled by forming implementation intentions. Extending earlier work by Gollwitzer and Schaal (1998), Stewart and Payne (2008) examined whether implementation intentions designed to counter automatic stereotypes (e.g., “When I see a black face, I will then think ‘safe’”) could reduce stereotyping toward a category of individuals (versus a single exemplar). The authors use the Process Disassociation Procedure (PDP; Jacoby, 1991) to estimate whether the reduction in automatic stereotyping came about by reducing automatic stereotyping, increasing control, or a combination of these two processes. It was found that implementation intentions reduced stereotyping in a weapon identification task (Studies 1 and 2) and an IAT task (Study 3) by reducing automatic effects of the stereotype (without increasing conscious control). This reduction in automatic race bias held for even new members of the category (Study 2). These studies suggest that implementation intentions are an efficient way to overcome automatic stereotyping.

Schweiger Gallo, Keil, McCulloch, Rockstroh, and Gollwitzer (2009, Study 3) analyzed whether it is possible to curb habitual affective responses by forming implementation intentions. They found that implementation intentions specifying an ignore response in the then-component helped control fear in response to pictures of spiders in participants with spider phobia—to the low level that was experienced by participants who did not report any spider phobia. The obtained electrophysiological correlates (the authors had used dense-array EEG) revealed that those participants who bolstered their goal intention to stay calm with an ignore-implementation intention showed significantly reduced early activity in the visual cortex in response to spider pictures, as reflected in a smaller P1 (assessed at 120 milliseconds [msec] after a spider picture was presented). This suggests that the ignore-implementation intention assigned to spider phobics lead to a strategic automation of the specified goal-directed response (in the present case, an ignore response) when the critical cue (in the present case, a spider picture) was encountered, so that—using the horse race metaphor—the planned response (i.e., ignore response) could outrun the habitual response (i.e., fear response).

Various studies have analyzed the control of habitual behavioral responses. For instance, Cohen, Bayer, Jaudas, and Gollwitzer (2008, Study 2; see also Miles & Proctor, 2008) explored the suppression of habitual responses by implementation intentions using the Simon task. In this task paradigm, participants are asked to respond to a nonspatial aspect of a stimulus (i.e., whether a presented tone is high or low) by pressing a left or right key, and to ignore the location of the stimulus (i.e., whether it is presented on one's left or right side). The difficulty of this task is in ignoring the spatial location (left or right) of the tone in one's classification response (i.e., pressing a left or right response key; Simon, 1990). The cost in reaction times is seen when the location of the tone (e.g., right) and required key press (e.g., left) are incongruent, as people habitually respond to stimuli presented at the right or left side with the corresponding hand. Cohen et al. (2008, Study 2) found that implementation intentions eliminated the Simon effect for the stimulus that was specified in the if-component of the implementation intention. Reaction times for this stimulus did not differ between the congruent and incongruent trials (i.e., they were fast throughout).

Further studies on the control of habitual behavioral responses by implementation intentions analyzed reducing the behavioral expression of stereotypical bias (using the shooter paradigm; Mendoza, Gollwitzer, & Amadio, 2010), abolishing concept and goal priming effects on behavior (using different concept and goal priming methods; Gollwitzer, Sheeran, Trötschel, & Webb, 2011), stopping overlearned responses to critical stimuli (using the stop signal task in children with ADHD; Gawrilow & Gollwitzer, 2008), and breaking bad eating habits (using a lexical decision task presenting the unwanted food item as the critical word; Adriaanse, Gollwitzer, De Ridder, De Wit, & Kroese, 2011).

Still, one wonders whether forming implementation intentions will always block habitual responses. Using a horse race metaphor, the answer has to be no. Whether the habitual response or the if-then guided response will win the race depends on the relative strength of the two behavioral orientations. If the habitual response is based on strong habits (Webb, Sheeran, & Luszczynska, 2009) and the if-then guided response is based on weak implementation intentions, then the habitual response...
should win over the if-then planned response; and the reverse should be true when weak habits are sent into a race with strong implementation intentions. This implies that controlling behavior that is based on strong habits requires the formation of strong implementation intentions. One effective strategy pertains to creating particularly strong links between situational cues (if-component) and goal-directed responses (then-component). Knüppel, Roseman, Johnson, and Krantz (2009; see also Papiès, Aarts, & de Vries, 2009) asked participants to use mental imagery when linking situational cues to goal-directed responses in their if-then plans, and found that the rate of initiation of the planned response increased by almost 50%. Finally, using the if-then format for spelling out one’s implementation intentions benefits their effectiveness. Chapman, Armitage, and Norman (2009) observed that for the goal to increase one’s fruit and vegetable intake an if-then implementation intention had greater impact than an implementation intention that settled with simply listing the when, where, and how of acting toward the goal.

What else strengthens (or weakens) the effects of implementation intentions? For strong implementation intention effects to occur people need to be highly committed to the superordinate goal intention (e.g., Gollwitzer 1999; De Nooijer, De Vet, Brug, & De Vries, 2006; Orbell, Hodgkins, & Sheeran, 1997; Sheeran, Webb, & Gollwitzer, 2005, Study 1; Verplanken & Faes, 1999), which is facilitated when this goal is self-consistent (Koestner, Lekes, Powers, & Chicoine, 2002) and the self-efficacy to reach the goal is high (Koestner et al., 2006, Study 2; Wieber, Odenthal, & Gollwitzer, 2010); furthermore, the goal needs to be in a state of activation (Sheeran et al., 2005, Study 2). These prerequisites help flexible goal striving because they prevent rigid plan enactment even when people have reached the goal, disengaged from the goal, or are in a situation where striving for the goal is inappropriate; in other words, the automaticity achieved by implementation intentions is a goal-dependent automaticity (Bargh, 1989). There may, however, be a cost to this flexibility associated with goal dependency: Recent research by Wieber et al. (2011) finds that people who have formed implementation intentions for the goal of eating more healthy food, but subsequently are induced to reflect on the reasons for striving to reach this goal (such as, e.g., a better health, a more beautiful body) no longer benefit from their if-then plans. Apparently, any doubts about the reasons for striving for a goal can undermine the effectiveness of respective if-then plans. This is in line with findings that the induction of the distinct emotion of sadness leads to weaker implementation intention effects as compared to the induction of the distinct emotion of anger (Maglio, Gollwitzer, & Oettingen, in press).

Not surprisingly, it was found that the commitment to the formed implementation intention also needs to be strong to produce beneficial effects of if-then planning (e.g., Achitziger, Bayer, & Gollwitzer, 2010, Study 2). When participants doubted the appropriateness of forming implementation intentions, no implementation intention effects emerged. Additionally, people should find it easier to commit to if-then plans that specify feasible (i.e., high self-efficacy feelings) and desirable (i.e., high instrumentality beliefs; the intrinsic value or activity incentive is perceived as high, Koestner et al., 2006) responses in their then-part. In any case, the requirement of commitment to the if-then plan for implementation intentions to have an effect ensures that incidental if-then plans do not impair flexibility in striving for goal attainment (e.g., Gollwitzer, Parks-Stamm, Jaudas, & Sheeran, 2008).

Finally, personality attributes have been examined as moderators of implementation intention effects in two lines of research (Powers, Koestner, & Topciu, 2005; Webb, Christian, & Armitage, 2007). In the first set of studies (Powers et al., 2005), perfectionism was examined whereby self-oriented perfectionism was distinguished from socially prescribed perfectionism. Whereas the standards for self-oriented perfectionists are set by the people themselves, socially prescribed perfectionists try to conform to standards and expectations that are prescribed by others. Powers et al. assessed goal progress with respect to New Year’s resolutions (i.e., three personal goals) in participants who formed implementation intentions as compared to participants who received control instructions only. Whereas for participants being high on self-oriented perfectionism, forming implementation intentions actually did improve goal progress, social perfectionists failed to benefit from implementation intentions. Perhaps social perfectionists find it difficult to commit to implementation intentions, as they may feel that the expectations and standards prescribed by others often change unexpectedly, and flexibly responding to such changes may be seen as impossible when one incurs a strong commitment to a given if-then plan.

In the second line of research on relevant personal attributes for implementation intention effects, conscientiousness was examined (Webb, Christian,
commitments (Oettingen et al., 2001). Implementation intentions are also found to show enhanced benefits when the specification of the if-component is personalized (Adriaanse, De Ridder, & De Wit, 2009), and mental contrasting guarantees the identification of personal critical obstacles that can then be used as the critical situation in the if-component of an implementation intention.

Indeed, in a recent intervention study with middle-aged women (Stadler, Oettingen, & Gollwitzer, 2009), participants were taught the cognitive principles and individual steps of the MCII self-regulation strategy. This intervention allowed participants to apply MCII to their idiosyncratic everyday wishes and concerns. Specifically, participants were taught to apply MCII by themselves to the wish of exercising more whenever possible. Hence, MCII is referred to as a metacognitive self-regulation strategy. Participants were free to choose whatever form of exercising they wished, and they were encouraged to anticipate exactly those obstacles that were personally most relevant and to link them to exactly those goal-directed responses that personally appeared to be most instrumental. As dependent measures, participants maintained daily behavioral diaries to keep track of the amount of time they exercised every day. Overall, teaching the MCII technique enhanced exercise more than the information-only control intervention; this effect showed up immediately after the interventions and it stayed stable throughout the entire period of the study (16 weeks after the intervention). More specifically, participants in the MCII group exercised nearly twice as much: an average of 1 hour more per week than participants in the information-only control group.

Conducting the same MCII intervention to promote healthy eating in middle-aged women (i.e., eating more fruits and vegetables) also produced the desired behavior change effects, and these persisted even over the extensive time period of 2 years (Stadler, Oettingen, & Gollwitzer, 2010). In another study, Adriaanse, Oettingen, Gollwitzer, et al. (2010) targeted the negative eating habit of unhealthy snacking in college students. MCII worked for both students with weak and strong such habits, and notably, it was more effective than mental contrasting or formulating implementation intentions alone. Moreover, MCII was observed to benefit chronic back pain patients in increasing their health behaviors (Christiansen, Oettingen, Dahme, & Klinger, 2010). Over a period of both 3 weeks and 3 months patients increased their exercise as compared to a standard
treatment control group. Exercise was measured by objective (i.e., bicycle ergometer test and number of lifts achieved in 2 minutes) and subjective indicators (reported physical functioning). Finally, MCII has shown beneficial effects outside the health area. For example, it benefited study efforts in adolescents preparing for standardized tests (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011). Together, these findings suggest that MCII is a cost- and time-effective self-regulation technique when it comes to the effective self-regulation of goal pursuit.

Conclusion and Outlook

The research on goals presented in this chapter paints a picture of an agentic individual who wisely sets goals and effectively acts upon them. She only needs to apply the self-regulatory strategies of goal setting and goal striving, that is, mental contrasting and implementation intentions. These strategies allow people to pursue realizing their idiosyncratic wishes and timber their own development according to principles of what is desirable and feasible. When applied in metacognitive form, mental contrasting and implementation intentions and especially their combined usage (MCII) will liberate people from being bound to erroneous engagement and bad habits. How these strategies can be applied to create goals of content and structure that will serve the realizing of people’s individual wishes (e.g., learning goals if the future outcome is to accumulate knowledge and performance goals when outperforming others is at stake) will need to be explored in future research.

References


Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and


Ryan, R. M., Sheldon, K. M., Kassee, T., & Deci, E. L. (1996). All goals are not created equal: An organizational perspective on the nature of goals and their regulation. In P. M. Gollwitzer & J. A. Bargh (Eds.), The psychology of action: Linking cognition and motivation to behavior (pp. 7–26). New York: Guilford Press.


Weiss, T. L., Ono, M. S., B, Sheeran, P., Reid, J. G., & Lavda, A. (2010). Using implementation intentions to overcome the effects of social anxiety on attention and appraisals


