CHAPTER 14

Goal Implementation
THE BENEFITS AND COSTS OF IF–THEN PLANNING

ELIZABETH J. PARKS-STAMM
PETER M. GOLLWITZER

Although the relationship between goals and behavior is substantial (Webb & Sheeran, 2006), even very motivated individuals at times fail to act on their goals. In this chapter, we discuss the role of plans in linking goals with actual behavior. We focus specifically on a certain type of plan, an if–then plan known as an implementation intention, and review its place in the course of goal striving. We review the mechanisms underlying the effects of implementation intentions. Then, we address the benefits and costs associated with these mechanisms of implementation intentions, as well as if–then planning in general. Last, we discuss what personal and situational factors moderate the effectiveness of implementation intentions, as well as the formation of implementation intentions.

Implementation Intentions and the Rubicon Model of Action Phases

The relationship between goals, planning, and behavior is outlined in the "Rubicon model of action phases" (Heckhausen & Gollwitzer, 1987; Gollwitzer, 1990). In this model, goal striving is temporally organized into four phases, which differ in both the tasks that are to be accomplished and the mind-sets associated with these tasks. The first predecisional phase involves

considering the desirability and feasibility of various unattained wishes and desires. Its associated deliberative mind-set is associated with open-mindedness and even-handed consideration of alternatives, such as when deciding between various wishes to pursue or even the choice between action and inaction (Heckhausen & Gollwitzer, 1987; Beckmann & Gollwitzer, 1987). This predecisional stage culminates in a *goal intention,* a desired end-state the individual is committed to achieve: "I intend to perform Behavior *X*/to reach Outcome *X*" (e.g., to exercise regularly, to get an "A" in Introductory Psychology). This transformation from considering unattached wishes and desires to forming a goal intention is described as "crossing the Rubicon," because it is at this point that goal pursuit begins; from this point, one can either succeed or fail in achieving the goal intention. However, most goal-directed actions do not flow directly from this goal intention; often individuals fail to initiate any goal-directed behaviors after forming their goal intention. This may occur because individuals forget to act on their goal after it is formed, they miss good opportunities to act toward their goal, or they succumb to initial reluctance to act as is the case with goals that require overcoming unpleasant experiences at the start (e.g., starting to exercise; Gollwitzer & Sheeran, 2006). But even if people succeed with starting to act on their goals, there is always a risk that they will be derailed by difficulties, distractions, and disruptions (Gollwitzer, Bayer, & McCulloch, 2005). These problems associated with starting and continuing to act toward one's goals can be ameliorated by planning out how one's goals may be reached.

The time for planning comes in the preactional phase of goal pursuit, where the individual may arrange when, where, and how to act to realize the committed goal. Such planning is associated with an implemental (i.e., means-oriented) mind-set. This mind-set has been found to focus attention on information relevant to goal achievement (Beckmann & Gollwitzer, 1987) and away from the pros and cons of the selected or nonselected goals (Taylor & Gollwitzer, 1995; Gollwitzer, Heckhausen, & Steller, 1990). Ideally, this implementation-focused reasoning may result in one or more if–then plans, known as *implementation intentions* (Gollwitzer, 1993, 1999). This type of plan specifies an anticipated concrete situation that may signal an appropriate time to initiate goal-directed behaviors, and a response that could be used to work toward achieving the goal intention (i.e., an instrumental goal-directed response).

In the third stage of the model, the action phase, the goal-directed actions are actually initiated. This may involve enacting one planned behavior (e.g., getting the oil changed in the car as intended) or maintaining a number of goal-directed responses over a period of time. For example, to achieve an "A" in Introductory Psychology as intended, a student must carry out numerous studying behaviors, or enact one planned study

behavior numerous times throughout the semester. Thus, the action phase may be short or long in duration.

Finally, in the postactional phase, the outcomes of the goal-directed actions are evaluated against what was desired when the goal intention was formed (e.g., the student compares the final grade with the desired "A"). If there is still a gap between the desired state and the current situation, the individual may start to engage in new planning on how to reach the goal, or even in new deliberation on whether the goal should be given up and other goals should be pursued instead.

Thus, it is in the preactional phase that implementation intentions are formed, but they are then carried by the individual into the action phase. From there, implementation intentions drive goal pursuit "in the moment" in a largely automatic fashion. The automaticity of the goal-directed behaviors carried out in the action phase resulting from a plan determined in the preactional phase make implementation intentions a resource-saving strategy when the opportunity to act has arrived.

Why is the temporal placement of goals and plans important? Implementation intentions are not merely a strategy that one appends to a desire to facilitate goal achievement, but a concrete plan for how to implement a selected goal pursuit. Indeed, research has demonstrated that implementation intentions facilitate goal achievement only when the related goal intention is activated. Sheeran and colleagues found that their participants benefited greatly from implementation intentions when they were linked to a strong goal intention, but not when the goal intention was weak (Sheeran, Webb, & Gollwitzer, 2005). So implementation intentions affect behavior only when they plan out the implementation of a valued goal intention. How do they accomplish this? Because of the if–then structure of implementation intentions, their underlying mechanisms may differ from some other types of plans (e.g., the "rational" planning and organization behaviors assessed by the Galotti-Simons Planning Survey; Simons & Galotti, 1992). We review the unique contributions of these underlying mechanisms next.

The Mechanisms Underlying the Effects of Implementation Intentions

To form an implementation intention, the individual identifies a future goal-relevant situational cue (i.e., the if-component) and a related planned response to that cue (i.e., the then-component). Whereas a goal intention specifies the desired event in the form of "I intend to perform Behavior *X*/ to reach Outcome *X*" (e.g., to exercise regularly/ to get an "A" in Introductory Psychology), an implementation intention specifies both an anticipated goal-relevant situation and a proper goal-directed response. Thus, an implementation intention that served the goal intention to "get an 'A' in Introductory Psychology" would follow the form "*If* Situation *Y* arises (e.g., when I'm going to bed on Sunday night), *then* I will perform Behavior *Z* (e.g., set my alarm early to read the textbook before lecture)." An implementation intention is subordinate to its related goal intention, as it exists only to aid goal achievement (Gollwitzer, 1993, 1999). The added benefit of an implementation intention is clear: A meta-analysis by Gollwitzer and Sheeran (2006) involving over 8,000 participants in 94 independent studies reported an effect size of $d = 0.65$. This medium-to-large effect size (Cohen, 1992) represents the additional facilitation of goal achievement by implementation intentions compared to goal intentions alone. As goal intentions by themselves already have a positive effect on behavior enactment (Webb & Sheeran, 2006), the size of this effect is quite astounding.

How do implementation intention effects come about? The theory of implementation intentions separates the effects of the if-component from those of the then-component, as the theory proposes two processes associated with these components through which implementation intentions facilitate goal attainment (Gollwitzer, 1993). First, specifying an anticipated goal-relevant situational cue in the if-component is proposed to increase the accessibility of the critical situation. Secondly, linking a specified goal-directed response to this cue in the then-component is proposed to automate the execution of this response upon contact with the specified cue. By forming implementation intentions, people can strategically switch from conscious and effortful action initiation (guided by goal intentions in the action phase) to having their goal-directed responses automatically elicited by the specified situational cues (through the implementation intention formed during the preactional phase). We review evidence for the heightened activation of the situational cue specified in the if-component (i.e., the if-process), and the automaticity of performing the response specified in the then-component (i.e., the then-process).

The If-Process

Specifying a goal-relevant situation in the if-component of an implementation intention is proposed to increase the activation of the mental representation of this situation, thereby making the situational cues more accessible (Gollwitzer, 1999). Research has directly tested this accessibility hypothesis by investigating whether the cues associated with the critical situation are more accessible in individuals who have formed implementation intentions relative to those with mere goal intentions.

Aarts, Dijksterhuis, and Midden (1999) found support for the idea that implementation intentions increase the accessibility of the situational cues

related to the goal by employing a lexical decision task. First, all participants were given the goal to redeem a coupon in the middle of a mundane behavioral script (i.e., walking through the cafeteria to the building exit), as well as information about expected situational cues that would signal an opportunity to act on that goal. Half of the participants were asked to organize this information into an if–then plan. Before participants were given the opportuntity to act on their goal, they completed a lexical decision task. Aarts and colleagues found that individuals who had formed if–then plans identified words related to the anticipated situational cue faster than individuals who merely had the goal to redeem the coupon. In addition, the formation of the implementation intention significantly increased participants' redemption of the coupon. Importantly, the faster lexical decision latencies for these critical words (i.e., their heightened accessibility) mediated the relationship between planning and goal attainment. This study provides support for the hypothesis that the if-process of implementation intentions increases the accessibility of the situational cues.

The Then-Process

Specifying a goal-directed response in the then-component of an implementation intention has been shown to automate the initiation of the planned behavior upon contact with the situational cue, thereby allowing for goal pursuit that exhibits features of automaticity (Bargh, 1994). The automaticity of the response specified in the then-component has been supported in several studies demonstrating its immediacy (Gollwitzer & Brandstätter, 1997; Orbell & Sheeran, 2000), efficiency (Brandstätter, Lengfelder, & Gollwitzer, 2001; Lengfelder & Gollwitzer, 2001), and initiation without conscious intent (Bayer, Achtziger, Gollwitzer, & Moskowitz, in press). We will review evidence for each of these features of automaticity in turn.

The immediacy of the response specified in the implementation intention relative to responses guided by goal intentions alone has been supported by a laboratory experiment by Gollwitzer and Brandstätter (1997, Study 3). All participants were given the goal to express counterarguments to a proponent of discrimination against foreigners in Germany (presented in a video clip), and some were asked to form implementation intentions to specify a plan for how to do so. They found that participants with implementation intentions initiated the counterargument more quickly (without a cost to the quality of the arguments presented) than the participants who had merely formed the goal to counterargue. Orbell and Sheeran (2000) also found support for the immediacy of action initiation through implementation intentions in a field study of patients who had undergone joint replacement surgery. Patients who had formed implementation intentions about their recovery behaviors engaged in activities sooner than those who had not. The formation of implementation intentions mediated the relationship between expectations of recovery and the speed of action initiation. These two studies provided evidence that the initiation of the response specified in the then-component of an implementation intention exhibits immediacy.

A second feature of automaticity has been supported by Brandtstätter and colleagues, who used a go/no-go task to test the efficiency of the initiation of the response specified in an implementation intention (Brandtstätter et al., 2001). Participants formed the goal intention to press a button as quickly as possible when a number appeared on the screen, but not to respond when a letter appeared. Participants in the implementation intention condition additionally formed a plan to press the response button particularly quickly if the number "3" was presented. This go/no-go task was then completed by participants merely as a secondary task in a dual-task paradigm. The efficiency of implementation intentions was supported by evidence that the response latencies to the number "3" were reduced in the implementation intention condition compared to the goal-only group, regardless of whether the simultaneous primary task was easy or difficult to perform. Brandtstätter et al. found that the speed-up of the response specified in the implementation intention was unaffected by the cognitive demand of the primary task to be performed at the same time (e.g., a memorization task in Study 3 and a tracking task in Study 4). These findings provide support for the hypothesis that performing the behavior specified in the then-component of implementation intentions in response to encountering the situational cue specified in the if-component does require minimal cognitive resources.

Last, two studies by Bayer et al. (in press) tested whether implementation intentions could allow an individual to respond in a goal-directed manner without conscious intent. This line of research investigated whether implementation intentions, formed consciously in the preactional phase of goal striving, can automatically guide behavior in the action phase without a second conscious act of will. In Study 1, all participants had the goal to confront a rude individual. When the face of the rude individual was presented subliminally in a sequential priming task (in which participants were asked to read target words as quickly as possible), the words to be used in complaining to her about her rude behavior (e.g., offensive, mean, and conceited) were read more quickly by implementation intention participants than goal-only participants. This suggests that the subliminally presented situational cue enabled participants to begin bolstering themselves to act toward their goal, preparing the response specified in the then-component, even without conscious awareness of the cue. Study 2 further examined whether implementation intentions could enable actual action initiation without conscious intent. In this experiment, participants were assigned the goal to classify various figures into two categories: round or angular. Those in the implementation intention condition formed a plan

about one of these angular figures (e.g., "If I see a triangle, then I will press the right button particularly fast."). Bayer et al. found that participants in the implementation intention condition had faster response latencies for the angular figures (but not the rounded figures) when the specified situational cue (i.e., the triangle) was first presented subliminally than when it was not; no such effect was observed with goal intention participants. These subliminal priming effects suggest that the goal-directed behavior specified in an implementation intention is triggered by the anticipated situational cue without the need for a further conscious intention. Action initiation without conscious intent satisfies a central criterion for automatic action control.

The research reviewed above suggests that the two components of an implementation intention produce distinguishable effects during goal striving: The if-component heightens the activation of the specified situational cue, whereas the linked then-component automates the planned behavioral response upon contact with the cue. Often these two processes work together to enhance goal attainment. Webb and Sheeran (2007) simultaneously tested the impact of the cue accessibility associated with the if-component and the automatic response initiation associated with the then-component of the implementation intention on goal attainment. In their study, participants were either instructed to familiarize themselves with a target nonword (*avenda*) so they could respond quickly to that item (the goal-only condition), or to form a plan to respond quickly to this target nonword (the implementation intention condition). Participants were told that they would be searching for this nonword (along with others) in a word-search puzzle. Before they completed the word search, a sequential priming paradigm was used to measure the accessibility of this target nonword (i.e., the if-process) as well as the association between the target nonword and the planned response (i.e., the then-process). They found that the strength of each of these processes associated with implementation intentions independently mediated the effect of implementation intentions on goal attainment. In this experimental paradigm, both the if-process and the then-process facilitated goal attainment. However, depending on the goal being pursued and what behaviors are needed to act effectively toward that goal, these processes may help or hinder goal pursuit. The next section examines the potential benefits and costs of the if- and then-processes of implementation intentions.

The Benefits and Costs of Implementation Intentions

What are the implications of these two mechanisms of implementation intentions for goal pursuit? In terms of goal-related outcomes, there are benefits and costs of both the heightened activation of the specified cue

afforded by the if-component (the if-process), and the automatization of the response afforded by the linked then-component (the then-process).

The Benefits and Costs Associated with the If-Process

Benefits

One outcome of the heightened accessibility of the specified situational cues is that these cues are more easily identified. In an early investigation of facilitated cue detection, participants searched for a figure in an embedded figures task (Steller, 1992). Participants exhibited superior detection of the figures specified in the if-part of an implementation intention. Webb and Sheeran (2004) investigated whether this improvement in cue identification was due to increased activation or response bias. They found that participants with implementation intentions responded faster to critical cues than did goal participants but were not more likely to respond to similar but inappropriate cues (Webb & Sheeran, 2004, Study 3), supporting the heightened accessibility explanation of the enhanced identification. Thus, the if-component of implementation intentions may help individuals to quickly recognize goal-relevant opportunities when they arise.

One self-regulatory problem that this enhanced cue identification may help solve is the failure to seize a goal-relevant opportunity when it is available (Gollwitzer & Sheeran, 2006). Missing potential opportunities to act is particularly a problem for behaviors that must be initiated during a certain window of opportunity (i.e., short-fuse behaviors; Dholakia & Bagozzi, 2003). In daily life, one must act during a limited frame of time to catch a plane, vote, attend a meeting, pick up dry cleaning, or attend an exercise class. It is clear, even from this short list of examples, that many common goals are served by short-fuse behaviors. Research has shown that implementation intentions do help individuals seize the opportunity to act when it is presented briefly; in their study of short-fuse behaviors, Dholakia and Bagozzi (2003) found 70% of participants who had formed implementation intentions took advantage of the opportunity during the allotted time compared to only 33% of participants with goals alone. In a meta-analysis of 20 tests of seizing opportunities (with over 2,000 participants), Gollwitzer and Sheeran (2006) found a medium-to-large effect size of implementation intentions relative to mere goals ($d = 0.61$).

Another benefit of the heightened accessibility of the situational cues specified in implementation intentions is the superior recall of the planned opportunities. In one study, research participants formed implementation intentions specifying when, where, and how they would perform an experimental task from numerous predesigned options. Immediately, or 48 hours later, participants were given a surprise task to recall all of the situational cues they had been provided. Those cues specified in implemen-

tation intentions were more successfully recalled than nonspecified cues, whether recall was tested immediately or at a later point in time (i.e., 2 days later; Achtziger, Bayer, & Gollwitzer, 2008).

Facilitated recall of specified opportunities may be especially beneficial for goal striving when opportunities to work toward the goal are rarely encountered. Sheeran and Orbell (1998) reported a strong negative correlation between the latency to act and goal achievement, illustrating that the longer the time interval between the goal intention and the opportunity to act, the less likely it is that intentions will be realized. In these cases, goal achievement may be prevented simply because individuals fail to recall how they wanted to act on their goal intention (Gollwitzer & Sheeran, 2006). For example, in an intervention designed to promote breast self-examination, 64% of women who had formed an implementation intention did perform a breast self-exam, whereas only 14% of those in the control group did. Of the participants in the control group who failed to perform a self-exam, 70% blamed their failure on forgetting to act on their goal (Orbell, Hodgkins, & Sheeran, 1997). Thus, people who have specified select opportunities in which to act on their goals will more easily recall when and where they wanted to act on them, and thus will be more likely to act in these situational contexts (e.g., a page to be marked in a booklet; Chasteen, Park, & Schwarz, 2001). According to Gollwitzer and Sheeran (2006), in their meta-analysis of 11 studies associated with remembering to act, the impact of implementation intentions was medium-to-large in size ($d = 0.54$).

Another benefit of the heightened accessibility of the situational cues in the if-component is that they may be observed even when one is busy with other things. The heightened accessibility means that the specified cues command attention, disrupting even attention that is focused elsewhere. Using a dichotic-listening paradigm, Gollwitzer et al. (2002) found that words related to a specified anticipated situation presented in the unattended channel were more disruptive to focused attention for implementation intention participants than goal intention participants. Individuals who had formed a plan specifying the anticipated goal-relevant situation showed a reduction in their performance in the primary task when they heard cue-related words. The disruption of focused ongoing activity demonstrates the heightened accessibility of these cues; even when endeavoring to ignore them, the cues specified in the if-component of an implementation intention readily capture attention. This disruption of otherwise-focused attention is clearly a benefit for goal pursuits that involve unexpected opportunities to act as goal-relevant cues may appear when one is engaged in another activity or thought.

In addition, situational cues may be especially easy to miss when one is engaged in a mundane behavioral script that requires little attention to the environment. In the Aarts et al. (1999) study described earlier, participants

were presented with the opportunity to act while walking through a commonly used cafeteria to the building exit—a mundane behavioral script that required little attention to the external environment for the students. Aarts and colleagues argued that it is the increased accessibility of the situational cues that allowed participants to interrupt their mundane behavioral script and recognize the opportunity to act toward their goal. Thus, implementation intentions disrupt attention focused on goal-irrelevant topics, whether they are external or internal. These two examples represent very common situations that may impede recognition of the opportunity to act in real life. These studies provide examples of ways that the heightened accessibility of the situational cue afforded by the if-component of implementation intentions can provide benefits to goal pursuit.

Costs

The heightened activation of the situational cue specified in a plan can also result in costs for goal pursuit. When there are multiple possible situations or various appropriate opportunities in which to engage in a given goal pursuit, this heightened activation of one approach to the goal may become a liability for overall goal pursuit. Parks-Stamm, Gollwitzer, and Oettingen (2007, Study 1) found that the facilitated identification of the planned situation specified in the if-component of an implementation intention is associated with a reduced identification of alternative goal-relevant situations relative to goal-only participants. In this study, participants were given the goal to identify all the five-letter words in a story by typing in the first letter of the word. Thus, the if-process (i.e., counting letters in words to identify the goal-relevant situation) was difficult and required much cognitive capacity, but the then-process (i.e., typing in the first letter of the word to respond) was quite easy. Because implementation intentions only aid in difficult tasks, the effect of implementation intentions on the if-process would be seen in this task. Participants were then given information about two anticipated situational cues ("Laura" and "mouse"), which would account for only half of the presented opportunities to act toward the goal. Half of the participants formed implementation intentions with these situational cues (e.g., "And if I hear Laura, then I will press L," "And if I hear mouse, then I will press M"), and the goal participants merely familiarized themselves with these target words and the correct response. As one might expect, individuals who formed implementation intentions about these situational cues were better at identifying the situational cues specified in their implementation intentions. However, they were also worse than goal-only participants at identifying alternative, nonspecified cues that were equally valid means to achieve the desired goal.

Thus, when there are many routes to a goal, and one's implementation intention only specifies one or two of these opportunities, the heightened

accessibility of the planned route may draw attention away from novel opportunities to act, harming overall goal pursuit. For example, if I have the goal intention to include more vegetables in my diet, and I make an implementation intention specifying broccoli as my situational cue (e.g., "if I see broccoli on the menu, then I will order that plate!"), this should increase my broccoli intake in restaurants. However, this may lead me to pass over the salads, carrots, and mixed vegetable plates. This plan may actually harm my ability to recognize other, possibly more valuable, goal-relevant situations in which to work toward my goal.

In addition to costs in identifying alternative goal-relevant opportunities to act in any given goal pursuit, planning one goal pursuit may also result in costs to other concurrent goal pursuits. The heightened accessibility of the cues specified in the if-component of implementation intentions may create costs because these cues automatically attract attention even when they are not relevant to one's current focal goal. As described above, Achtziger and colleagues (2008) showed in a dual-task paradigm that the heightened accessibility of the specified cues presented in an unattended channel disrupted performance on a primary task. The heightened accessibility of the situational cues specified for one goal pursuit thereby impeded a concurrent goal pursuit in this dual-task paradigm. This suggests that the heightened accessibility of the situational cues could result in a cost in pursuing alternative goals, as well.

Costs to alternative concurrent goal pursuits should be especially pronounced when there is an overlap between the planned situational cues and the cues currently encountered. Wieber and Sassenberg (2006) explored the effect of implementation intentions when a current (alternative) goal pursuit requires one to attend to different cues, but the specified situational cues were still present. Thus, the cues specified in the if-component of the implementation intentions for one task were actually distractors for the second task. In two studies, participants showed costs in their performance when pursuing a secondary goal because attention was drawn to the now-irrelevant cues from the prior implementation intention. Their results suggest that these costs are a result of implementation intentions drawing away limited attentional resources, rather than a derivative of the motor response system. These findings illustrate the costs planning may have for concurrently pursued goal pursuits. It also suggests that costs may be especially likely when the selected cues are commonly encountered in goal-irrelevant situations. If the cues are relevant to other goal pursuits, or are best left ignored to pursue other goals, the increased accessibility of these cues could be especially distracting.

However, even this cost has its limitations. The extent to which actual behavior is affected by an implementation intention appears to depend on the activation of the respective superordinate goal. There is evidence

that implementation intentions do not compulsorily affect behavior any time the critical situation specified in the if-part of the implementation intention is encountered, but only when its respective superordinate goal is activated (Sheeran et al., 2005, Study 2). It appears then that the heightened accessibility of the situational cues specified in the if-component of an implementation intention may automatically capture attention away from a focal goal pursuit only if the nonfocal goal that had been furnished with an implementation intention is also activated.

The Benefits and Costs Associated with the Then-Process

Benefits

The automaticity afforded by the then-component of an implementation intention provides clear benefits for goal pursuit. Individuals are able to initiate the specified goal-directed behaviors immediately (Gollwitzer & Brandstätter, 1997; Orbell & Sheeran, 2000), efficiently (Brandstätter et al., 2001; Lengfelder & Gollwitzer, 2001), and without a second conscious act of will (Bayer et al., in press). Through implementation intentions, planned goal-directed behaviors essentially become habits that are initiated effortlessly (Aarts & Dijksterhuis, 2000). The possible benefits associated with each of these features of automaticity will be addressed individually below.

There are certain goal pursuits for which response immediacy is important and beneficial. For example, short-fuse behaviors (Dholakia & Bagozzi, 2003) must be performed in a given window of time. In these cases, responding quickly can be a benefit to goal pursuit. If people delay, considering their options and responses, the window of opportunity could pass without goal striving being initiated. Responding quickly is also particularly important for behaviors and responses that are always enacted immediately. Emergency room doctors and nurses often need to make split-second decisions in life-threatening cases, where deliberating about what response to enact could waste precious time. Providing these practitioners with implementation intentions that specify a response that can be initiated immediately when these dangerous situations are encountered could save lives when time is limited.

One benefit deriving from the efficiency of the then-response is that acting with an implementation intention allows an individual to work toward a goal without tiring as quickly as one acting on goal intentions alone. Muraven and Baumeister (2000) proposed that self-regulation failure often occurs because self-control is a limited resource, and the exertion of self-control leads to a reduction (or "depletion") of these resources. The result is a state known as *ego depletion*. In a typical demonstration of ego depletion, participants who were first asked to suppress certain thoughts