Setting One's Mind on Action: Planning Out Goal Striving in Advance

PETER M. GOLLWITZER

Abstract

Ineffective goal striving may be overcome using a simple self-regulation strategy: preparing goal striving in advance by forming implementation intentions (i.e., making if-then plans). This strategy helps to cope with the classic challenges to goal striving: getting started, staying on track, not overextending oneself, and disengaging from faulty means. Interestingly, these beneficial effects are observed no matter whether hindrances from within (e.g., ego depletion) or outside (e.g., social influence) the person are to be dealt with. In this essay, the processes on which the beneficial effects of implementation intentions are based will be discussed by pointing to relevant research using cognitive task paradigms and assessing brain data. Moreover, recent findings are reported demonstrating that implementation intentions can be used to curb reflexive cognitive, affective, and behavioral responses that interfere with a person's focal goal pursuit. In closing this essay, a behavior change intervention (i.e., mental contrasting with implementation intentions) is introduced that establishes the prerequisites for implementation intention effects to occur, and research areas in psychology are pointed to that could benefit from conducting implementation intention research.

SETTING ONE'S MIND ON ACTION: PLANNING OUT GOAL STRIVING IN ADVANCE

Being strongly committed to a goal is a necessary but often not sufficient step toward goal attainment as the way to the goal may be cobbled with difficulties, hindrances, and set-backs (Bargh, Gollwitzer, & Oettingen, 2010). The problems of goal implementation that people are most frequently confronted with are the following: people may fail to get started with goal striving, fail to stay on track when goal striving has been started, overextend with striving for the goal at hand thus losing sight of goals in other equally important life domains, and finally, people may fail to disengage from an unattainable goals or futile means. In fact, meta-analytic findings suggest that goals (also

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referred to as *goal intentions* as goals can be understood as instructions people give themselves to perform a certain behavior or to achieve a certain outcome) account for no more than 28% of variance in goal-directed behavior (Sheeran, 2002). An effective remedy to such impaired goal striving is planning out in advance how one wants to deal with the critical situations described earlier (i.e., furnishing one's goal intentions with implementation intentions).

Gollwitzer (1993, 1999) highlighted the importance of furnishing goal intentions with implementation intentions. While goal intentions (goals) have the structure of "I intend to reach X!" with X relating to a desired future behavior or outcome, implementation intentions have the structure of "If situation Y is encountered, then I will perform the goal-directed response Z!" Thus, implementation intentions define exactly when, where, and how one wants to act to realize one's goal intentions. In order to form an implementation intention, individuals need to identify a goal-relevant situational cue (such as a good opportunity to act or an obstacle to goal pursuit) and link it to an instrumental goal-directed response. While goal intentions merely specify a desired future behavior or outcome, the if-component of an implementation intention specifies when and where one wants to act on this goal (i.e., a certain situation), and the then-component of the implementation intention specifies the response that is to be initiated. For instance, a person who wants to complete a writing project (goal intention) might form the following implementation intention to support the attainment of her goal: "And whenever I sit down at my desktop computer, then I will immediately continue with writing on my manuscript!" Extensive empirical research supports the assumption that implementation intentions help close the gap between holding goals and attaining them, and this is true for all kind of goals in the academic, health, and interpersonal domains. A meta-analysis published in 2006 based on close to a hundred implementation intention studies showed a medium to large effect on increased rate of goal attainment ($d = 0.61$; Gollwitzer & Sheeran, 2006).

IMPLEMENTATION INTENTIONS AS A MEANS TO OVERCOME TYPICAL PROBLEMS OF GOAL STRIVING

Implementation intentions were found to help individuals *getting started* with goal striving in terms of remembering to act (e.g., taking a flu shot; Milkman, Beshears, Choi, Laibson, & Madrian, 2011) and overcoming an initial reluctance to act (e.g., with respect to undertaking a testicular self-examination, performing cervical cancer screening, resuming activity after joint replacement surgery, starting to eat a low-fat diet, and engaging in more physical exercise; summary by Gollwitzer, 2014).

However, many such goals (e.g., to eat a low-fat diet) cannot be accomplished by a discrete, one-shot action because they require that people keep striving over an extended period of time. *Staying on track* may then become very difficult when certain internal stimuli (e.g., being anxious and overburdened) or external stimuli (e.g., temptations and distractions) interfere. However, implementation intentions can be used to protect an ongoing goal striving from the negative influence of interferences from both inside and outside the person (e.g., Achtziger, Gollwitzer, & Sheeran, 2008). Such implementation intentions may use very different formats. For instance, if a teacher wants to stay friendly to a student who keeps making outrageous requests, she can form suppression-oriented implementation intentions, such as "And if the student approaches me with an outrageous request, then I will not get upset!" The then-component of such suppression-oriented implementation intentions does not have to be worded in terms of not showing (i.e., negating) the critical behavior (in the present example getting upset); it may alternatively specify a replacement behavior (" … , then I will respond in a friendly manner!"), or focus on ignoring the critical cue (" … , then I'll ignore her request!"). Recent research (Adriaanse, Van Oosten, De Ridder, De Wit, & Evers, 2011) suggests that negation implementation intentions are less effective than the latter two types of implementation intentions (i.e., replacement and ignore implementation intentions). However, an important alternative way of using implementation intentions to protect one's ongoing goal striving from derailment exists. One can also form implementation intentions geared toward stabilizing the ongoing focal goal pursuit (e.g., when I have finished the first part of the task at hand, then I will immediately turn to the second part). Bayer, Gollwitzer, and Achtziger (2010) demonstrated the effectiveness of this strategy in a series of studies analyzing whether making if-then plans that stabilize an ongoing goal pursuit effectively blocked the disruptive effects of self-doubts, inappropriate mood, and ego-depletion.

Goals that are no longer feasible and/or desirable in their current form may require *disengaging* from a chosen means or goals. Such disengagement from dysfunctional means or unattainable goals can free up resources and minimize negative affect (frustration) resulting from repeated negative feedback. However, because of self-defensiveness individuals often stick to a chosen means or goal too long thus ultimately hurting themselves. Luckily, implementation intentions can be used to promote functional disengagement by specifying negative performance feedback as a critical cue, and linking this cue to switching to an alternative goal or means. Indeed, when research participants were asked to form implementation intentions that linked negative feedback on the ongoing goal striving to immediately switching to a different means or goal or to reflecting on the message entailed by the received failure feedback on the ongoing goal striving, functional disengagement from goals

and means was found to occur more frequently than for participants who had only formed respective goal intentions or had formed no intentions at all (Henderson, Gollwitzer, & Oettingen, 2007).

Finally, forming implementation intentions can help *preventing resource depletion* as it enables individuals to engage in automated goal striving and behavior control that does not require high levels of deliberate effort (see the following text). Consequently, the self should not become depleted (Muraven & Baumeister, 2000) when goal striving is regulated by implementation intentions. Indeed, in studies using ego-depletion paradigms, research participants who formed implementation intentions to self-regulate performance on a first task did not show reduced self-regulatory capacity when asked to start working on a different subsequent task (e.g., Webb & Sheeran, 2003).

PROCESS EXPLANATION: AUTOMATIC ACTION INITIATION

Research on the underlying mechanisms of implementation intention effects (summary by Gollwitzer & Oettingen, 2011) 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), and the mental link created 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. This heightened accessibility of the if-part of the plan has been observed in several studies using different cognitive task paradigms (e.g., cue detection, flanker, dichotic listening, lexical decision, and cued recall task paradigms). In a study by Parks-Stamm, Gollwitzer, and Oettingen (2007) using a lexical decision task paradigm, it was even observed that implementation intentions not only increase the activation level of the specified critical cues but also diminish the activation level of nonspecified competing situational cues. There are also studies that explicitly tested whether the heightened accessibility of the mental representation of critical cues that are specified in an implementation intention mediated the attainment of the respective goal intention. For instance, Aarts, Dijksterhuis, and Midden (1999), using a lexical decision task, found that the formation of implementation intentions led to faster lexical decision times for those words that described the specified critical situation. Furthermore, the heightened accessibility of the critical situation (as measured by faster lexical decision responses) mediated the beneficial effects of implementation intentions on goal attainment.

Further studies indicated that forming implementation intentions not only heightens the activation level of the mental presentation of the situational

cues specified in the if-component but also creates a strong associative link between the mental representation of the specified opportunity and the mental representation of the specified response. These associative links seem to be quite stable over time (Papies, Aarts, & de Vries, 2009). In mediation analyses, it was found that cue accessibility and the strength of the cue-response link conjointly mediated the impact of implementation intention formation on goal attainment (Webb & Sheeran, 2008).

Gollwitzer (1999) argued that the strong associative (critical situation with goal-directed response) links created by forming implementation intentions should lead to automatic action initiation once the critical cue is encountered. Indeed, extensive experimental research found that the initiation of the goal-directed responses specified in the then-component of implementation intentions did exhibit features of automaticity, including immediacy, efficiency, and no conscious involvement (in the sense that no conscious self-instruction to act is needed). If-then planners were found to act more quickly (e.g., Gollwitzer & Brandstätter, 1997, Experiment 3), to deal more effectively with cognitive demands (i.e., the speed-up effects still evinced under high cognitive load; Brandstätter, Lengfelder, & Gollwitzer, 2001), and they did not need to consciously intend to act in the critical moment. Consistent with this last assumption, implementation intention effects are observed even when the critical cue was presented subliminally (e.g., Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009).

Further support for the hypothesis that action control by implementation intentions qualifies as automatic was obtained in an fMRI study reported by Gilbert, Gollwitzer, Cohen, Oettingen, and Burgess (2009), in which participants had to perform a prospective memory task (i.e., degree of acting on a prospective stimulus is assessed) on the basis of either mere goal or goal plus 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, Dumontheil, & Gilbert, 2007).

THE POWER OF PLANNING

Any self-regulation strategy that claims to facilitate goal striving has to prove itself under conditions in which people commonly fail to meet their goals. Such conditions are manifold, but the following three situations stick out: (i) situations in which a person's knowledge and skills constrain performance, such as taking difficult academic tests; (2) situations in which

an opponent's behavior limits one's performance, as is true for competitive performance settings; and (3) situations in which the wanted behavior (e.g., no littering) runs into conflict with reflexive antagonistic responses (i.e., habitual littering). For all three of these situations, implementation intentions, however, stood their test.

As to situations where knowledge and skills constrain performance and thus willpower is needed to persist on the challenging task at hand, simple implementation intentions were found to enhance participants' performance on a standardized intelligence test. Participants only had to form the following implementation intention: "Whenever I start a new problem on this test, then I will tell myself: I can solve this problem!" (Bayer & Gollwitzer, 2007). As to situations where an opponent limits one's performance, studies in which pairs of negotiators had to distribute a common resource were conducted (Trötschel & Gollwitzer, 2007). In these studies, negotiators played the roles of representatives of two neighboring countries and negotiated the distribution of the regions, villages, and towns of a disputed island. When the participants formed implementation intentions to make cooperative counterproposals whenever a proposal from the counterpart was received, the pairs of negotiators managed to be more cooperative even when the negotiation had to take place under a loss frame (i.e., participants are told how many points they lose rather than win during each round of negotiation and are thus reluctant to make concessions). Apparently, implementation intentions managed to break the competiveness enhancing the effect of loss framing. Recent research using the ultimatum game also showed that implementation intentions can help performance in the face of opponents. Impulsive rejections of unfair offers at a cost to oneself were successfully curbed by making if-then plans geared toward down-regulating anger (Kirk, Gollwitzer, & Carnevale, 2011).

Finally, as to situations where a desired behavior is in conflict with an antagonistic reflexive response a host of studies has been conducted as well. The self-regulation of an ongoing goal pursuit becomes particularly difficult when reflexive responses are in conflict with initiating and executing the needed goal-directed responses that are instrumental to goal attainment (Wood & Neal, 2007). Can the self-regulation strategy of forming if-then plans help people to let their goals win out over their habitual reflexive responses? By assuming that action control by implementation intentions is immediate and efficient, and adopting a simple horserace model of action control (Adriaanse, Gollwitzer, De Ridder, De Wit, & Kroese, 2011), people should be in a position to break habitual responses by forming implementation intentions that spell out a response contrary to the habitual response to the critical situation. This assumption has been tested by analyzing the control of various kinds of reflexive responses: cognitive, affective, and behavioral.

Automatic biases, such as stereotyping, represent a *reflexive cognitive* response that can be in opposition to one's fairness goals. Extending earlier work by Gollwitzer and Schaal (1998); Stewart and Payne (2008) found that implementation intentions designed to counter automatic stereotypes (e.g., "When I see a black face, I will then think 'safe'!") could indeed reduce automatic stereotyping. Research by Mendoza, Gollwitzer, and Amodio (2010) using the so-called shooter task paradigm has added to these findings by showing that the down-regulation of automatic stereotyping by implementation intentions has the desired behavioral consequences.

With respect to *reflexive affective* responses, a study by Schweiger Gallo, Keil, McCulloch, Rockstroh, and Gollwitzer (2009, Study 3) using dense-array EEG showed that implementation intentions specifying an ignore-response in the then-component of an implementation intention helped control fear in response to pictures of spiders in participants with spider phobia (who are known to reflexively show fear responses when confronted with spider pictures). Importantly, the obtained electro-cortical correlates 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 ms after a spider picture had been presented). This EEG finding suggests that implementation intentions indeed lead to strategic automation of the specified goal-directed response (an ignore response) when the critical cue (a spider picture) is encountered, as conscious effortful action initiation is known to take longer than 120 ms (at least 300 ms). Apparently, this strategically automated ignore-response managed to outrun the reflexive fear response that characterizes individuals with spider phobia.

Finally, with respect to *reflexive behavioral* responses, Cohen, Bayer, Jaudas, and Gollwitzer (2008, Study 2) demonstrated that implementation intentions help suppressing habitual behavioral responses in a Simon classification task. For this task, it is found that classifying stimuli (e.g., low vs high tones) with the hand that corresponds to the location of the presented stimulus (e.g., low tones presented on the left side with the left hand and high tones presented on the right side with the right hand) is faster than classifying them with the noncorresponding hand (e.g., low tones presented on the left side with the right hand and high tones presented on the right side with the left hand). Specifying a noncorresponding response in an implementation intention that is geared toward fast responding did effectively alleviate the comparative disadvantage (reduced speed) of classifications made by the noncorresponding hand. Moreover, implementation intentions were found to help people to control behavioral priming effects (Gollwitzer, Sheeran, Trötschel, & Webb, 2011) and break bad snacking habits Adriaanse,

Gollwitzer, *et al.,* 2011). Finally, in studies with children with ADHD, it was observed that implementation intentions can help to inhibit overlearned responses (Gawrilow & Gollwitzer, 2008) and to slow impulsive responses in a delay of gratification task (Gawrilow, Gollwitzer, & Oettingen, 2011).

Still, forming implementation intentions may not always block reflexive responses. Whether the reflexive response or the if-then guided response will "win the race" depends on the relative strength of the two behavioral orientations. If the reflexive response is based on strong habits, and the if-then guided response is based on weak implementation intentions, the reflexive response should win over the if-then planned response; and the reverse should be true when weak habits are in conflict with strong implementation intentions. This implies that controlling behavior based on strong habits requires the formation of strong implementation intentions. Such enhancement of if-then plans can be achieved by various measures. One pertains to creating particularly strong links between situational cues (if-component) and goal-directed responses (then-component) for instance by asking participants to use mental imagery. Alternatively, people can tailor the critical cue specified in the if-part of an implementation intention to personally relevant reasons for the habitual behavior one wants to overcome and then link this cue to an antagonistic response. In addition, certain formats of implementation intentions (i.e., replacement and ignore implementation intentions) seem to be more effective in fighting habits than others (i.e., negation implementation intentions). Moreover, there is also the option of forming an implementation intention that targets the elicitation of a reflective mindset when the critical situation is encountered; this mindset should be incompatible with automatic responding and thus hamper reflexive responses (see Gollwitzer, 2014).

FUTURE RESEARCH ON IMPLEMENTATION INTENTIONS

One avenue for future research on implementation intentions is using them to enrich behavior change interventions. Implementation intentions are known to unfold their beneficial effects in particular when goal commitment and implementation intention commitment is high (Achtziger, Bayer, & Gollwitzer, 2011; Sheeran, Webb, & Gollwitzer, 2005, Study 2). Accordingly, behavior change interventions involving implementation intentions need to assure these prerequisites. One intervention that does this very effectively is called mental contrasting (Oettingen, 2012). Engaging in mental contrasting (Oettingen, Pak, & Schnetter, 2001) requires from participants to juxtapose

fantasies about desired future outcomes with obstacles of present reality. This mental exercise not only creates strong goal commitments but also guarantees the identification of personally relevant obstacles that can then be specified as the critical cues in the if-component of implementation intentions; moreover, mental contrasting has been found to create a readiness for making plans that link obstacles to instrumental behaviors. Recent intervention research has combined *m*ental *c*ontrasting with forming *i*mplementation *i*ntentions (i.e., created MCII). MCII intervention studies observed lasting behavior change with regard to physical exercise and healthy eating (4 months to 2 years, respectively; Stadler, Oettingen, & Gollwitzer, 2009, 2010). In addition, MCII helped to control the negative eating habit of unhealthy snacking in college students (Adriaanse, Oettingen, *et al.,* 2010). Here, MCII worked for both students with weak and strong such habits, and it was more effective than either mental contrasting or forming implementation intentions alone. Finally, MCII has been found to have beneficial effects outside of the health domain as well. For example, it benefited study efforts in adolescents preparing for standardized tests (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011) and promoted integrative bargaining in dyads negotiating over the sale of a car (Kirk, Oettingen, & Gollwitzer, 2013).

Another new line of implementation intention research pertains to the use of implementation intentions in groups. The questions addressed in this research are twofold: First, it is asked whether individual group members can use implementation intentions to promote collaboration and thus improve group performance. Second, it is asked whether groups can also use We-implementation intentions (If we encounter … , then we will … !) to promote group performance, and which type of implementation intention (I- vs We-Implementation Intentions) is more conducive to promoting the various types of group performance (Wieber, Thürmer, & Gollwitzer, 2013).

A final new line of implementation intention research pertains to facilitating social interactions. For instance, Stern and West (2014) report that implementation intentions specifying how to act when feeling anxious boosts interest in sustained contact and close interpersonal distance in interracial interactions. Moreover, it was demonstrated by Przybylinski and Andersen (2013) that transference (which is known to run off outside of conscious awareness and often affects ongoing social interactions negatively) can be effectively prevented using implementation intentions. And finally, Wieber, Gollwitzer, and Sheeran (2013) found that mimicry effects on social interactions are controllable by forming implementation intentions—even though people are not usually aware of the influences that mimicry exerts on their judgments and behavior.

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