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FROM THOUGHT TO AUTOMATIC ACTION

Strategic and Spontaneous Action Control by If-Then Planning

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If-then action planning (i.e., *implementation intentions*; Gollwitzer, 1999) is an effective self-regulation strategy. It entails mentally linking an intended action to a critical situation in a verbal if-then plan (e.g., "If I enter the cafeteria, then I will buy an apple"). Formulating such a plan increases the likelihood of actually performing the intended action as soon as the specified critical situation arises. Importantly, the initiation of the planned action exhibits features of automaticity (i.e., fast, efficient, and without requiring another conscious intent; Bargh, 1994). Thus, if-then planning is an intriguing instance of how "controlled" conscious thought at one point in time can lead to "automatic" action at a later point in time.

If-then planning merits an analysis from the perspective of dual-system models, because the control-automaticity dimension is a topic that is commonly addressed in dual-system models (e.g., Evans, 2008; Strack & Deutsch, 2015; Weber & Johnson, 2009). A central assumption of these models is that human decision making and behavior is governed by two distinct, interacting systems: a reflective and an impulsive system (Strack & Deutsch, 2004). While mostly remaining silent with regard to the nature of the interaction, research on if-then action planning provides insights into how the reflective and impulsive systems coordinate their operation of conscious, controlled processes (i.e., planning an action in advance) and automatic processes (i.e., initiating planned action upon encountering the critical situation) in order to achieve goal-directed behavior.

As we are primarily concerned with action control, in the current chapter, we turn to the Reflective–Impulsive Model (RIM; Strack & Deutsch, 2004) as it stands out from other dual-system models of decision making by explicitly

addressing behavioral outcomes and acknowledging the importance of interactions between the two systems. We have ordered the current chapter with two closely related goals in mind. First, in Part 1, we aim to relate if-then planning to several central features of the RIM, allowing us to introduce if-then action planning but also to identify new or previously ignored aspects. Based on this introduction of strategic if-then planning, in Part 2, our goal is to expand the current reach of if-then planning by discussing how if-then plans may occur and affect actions spontaneously in everyday situations (e.g., during mind-wandering).

The Self-Regulation Perspective on If-Then Planning

The traditional self-regulation view on if-then action planning recognizes the importance of if-then plans for goal achievement. Specifically, the mere intention to perform a desired behavior (e.g., eating more healthy food) does not ensure that the goal is actually achieved (*intention-behavior gap*; e.g., Sheeran, 2002). However, action plans in an if-then format (e.g., *"If I enter the cafeteria, then I will buy and eat an apple"*) can decrease the intention-behavior gap. An if-then action plan links a *critical situation* representing a good opportunity to attain the goal (e.g., the company's daily visited cafeteria full of unhealthy snacks) to an *instrumental behavior* to facilitate goal achievement (e.g., buying and eating an apple). Formulating such an if-then plan has been shown to increase the likelihood of actually performing the intended action in the anticipated situation and thus increase the rate of achieving the superordinate goal (reviewed in several meta-analyses; e.g., Gollwitzer & Sheeran, 2006).

The characteristics of action arising from if-then plans have important impli-cations for the broader topic of human action control. First, the effects of if-then planning attest to the role of conscious thought in generating and controlling actions. This might sound like a trivial statement, but serious arguments have been raised against a causal role of conscious thought for human action (e.g., Libet, 2002; Soon, He, Bode, & Haynes, 2013) and the important influence of environ-mental cues on action has been highlighted (e.g., Bargh, 1999). However, if-then planning provides direct empirical evidence that conscious thought—in this case formulating an if-then plan—does have an influence on actions (see Baumeister et al., 2011). Second, how this influence of thought on action is achieved is noteworthy, because it utilizes the environment; making if-then plans strategically delegates action control to the environment and thus liberates the individual from having to deliberately initiate the action (Gollwitzer & Schaal, 1998). This strategic delegation is governed by two cognitive mechanisms: forming an if-then plan leads to a perceptual preparedness to recognize the critical situation (e.g., Achtziger, Bayer, & Gollwitzer, 2012; Parks-Stamm, Gollwitzer, & Oettingen, 2007; Wieber & Sassenberg, 2006), and a link between the critical situation (e.g., entering the cafeteria) and the intended behavior (e.g., buying an apple) is created (e.g., Adriaanse, Gollwitzer, de Ridder, de Wit, & Kroese, 2011;

Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009). Upon perceiving the critical situation, the intended response is cued by means of spreading activation.

In sum, identifying goal-facilitating behaviors in advance and linking them to good opportunities to implement them has been proven to be a good self-regulation strategy to promote one's goals. In the following sections, we will adopt the perspective of the Reflective–Impulsive Model and relate the characteristics of if-then planning to its central features (Strack & Deutsch, 2004).

Mapping If-Then Planning to a Dual-System Framework

Dual-system theories such as the Reflective–Impulsive Model (RIM; Strack & Deutsch, 2004) hypothesize that two distinct systems underlie human behavior. These systems differ in that one—the reflective system (RS)—is based on propositional reasoning, works slowly (but can learn quickly), needs cognitive capacity, and permits conscious awareness of critical parts of the processed information. The other system—the impulsive system (IS)—is based on associative spread of activation, works quickly (but learns slowly), needs little attentional resources, and does not necessarily rely on conscious processing of information. Research has focused on the conflicts between these systems and on mapping when and under what conditions one or the other system gains control over the output of our cognition (e.g., decisions or actions; reviewed by Hofmann, Friese, & Strack, 2009). If-then action planning is a case in which the virtues of both systems are utilized to bring behavior in line with one's goals. In linking the core features of the RIM (Strack & Deutsch, 2004) to if-then planning, we hope to identify new or previously ignored aspects of if-then plans and to advance our understanding of how the interplay between the impulsive and reflective cognitive systems enable action control by planning. We will focus on some of the 10 RIM theses formulated by Strack and Deutsch (2004), rearranged to best introduce and analyze action control by if-then planning.

Intending (RIM Thesis 7)

It is hypothesized that in the reflective system, a behavioral decision is linked to behavioral schemata by the process of intending. Strack and Deutsch (2004) explicitly link this thesis to if-then action planning as described by Gollwitzer (1999). The whole present chapter is thus about this thesis and the process of "intending." At this point, we only want to add one specification with which most discussions of if-then planning start: we see if-then planning as a special case of "intending." A plain intention (or behavioral goal) is just the formulation of an intended behavior ("I want to eat more apples") or an intended outcome ("I want to be healthy"; e.g., Gollwitzer, 1999). An implementation intention, however, associates the behavioral intention with a critical situation to form an if-then plan (e.g., "*If I enter the cafeteria, then I will buy an apple*"). Unlike an if-then plan, the

plain intention is *not* associated with a situation that can serve as a trigger for the action. Thus, with respect to plain intentions, additional mechanisms are necessary to trigger the appropriate goal–directed action. As an association—as it is formed by if-then planning—is arguably a very simple psychological mechanism, any other or additional mechanisms required for plain intentions to be implemented will be more complicated and potentially less effective compared to implementation intentions.

Capacity (RIM Thesis 3)

Thesis 3 describes the capacity features of the impulsive and the reflective systems, asserting that processes in the reflective, but not the impulsive, system require a high amount of cognitive capacity. Therefore, the amount of information that can be processed at a given point in time is restricted in the reflective system. The impulsive system, in contrast, permits a more or less parallel processing of information and can operate even under suboptimal conditions, such as under high or low arousal. Action planning utilizes the advantages of the different systems; plans can be made under optimal capacity conditions to have them ready under suboptimal conditions. We will now take a closer look at the cognitive capacity demands of both phases.

Planning Phase

Research on implementation intentions has commonly focused on the feature of behavioral automaticity: characterizing if-then planned action initiation as fast, using little cognitive capacity, and requiring no further conscious intention. However, these characteristics pertain to the if-then planned action initiation but not to the process of making the if-then plan in the first place. An if-then action plan can be conceived of as a verbal description of a specific situation followed by a verbal description of an intended action (e.g., "If I enter the cafeteria, then I will buy an apple"). Furthermore, the if-then format implies that the action is supposed to happen when the situation occurs. Researchers often state that people must "form and commit to the if-then plan." In essence, this phrase means that the person repeats the plan in inner or self-directed speech while knowing that implementing the plan is beneficial for achieving a currently held goal.

The inner or self-directed speech that constitutes forming an if-then plan is an operation that requires cognitive or attentional capacity (e.g., phonological loop; Baddeley, 1992, 2001). It is hard to imagine having multiple coherent verbal streams of inner or self-directed speech with different content in parallel. In that sense, what is performed during the planning phase is an operation that exhibits the proposed characteristics of the reflective system.

Surprisingly, there are very few studies that actually tested different conditions under which if-then plans are formulated (Knäuper, Roseman, Johnson, &

Krantz, 2009; McFarland & Glisky, 2012). To our knowledge, there is one study that provides evidence for the necessity of a certain degree of attentional resources in the planning phase and thus the assumption that effective planning needs cognitive capacity. Papies, Aarts, and de Vries (2009) suggest that if-then planning goes beyond the mere creation of associations between the critical situation and the intended action. They had participants form a situation-action link by one of two procedures: one was a common if-then planning procedure in which the participants formulated and committed to an if-then plan, and the second was an associative-learning procedure in which the participants merely repeatedly observed the situation-action link. The study showed that both procedures were effective in guiding action immediately after the planning/learning phase. However, only if-then planning was still effective one week later. Besides the assumption that if-then planning creates something beyond a mere association, there is an alternative explanation for this finding that alludes to the amount of attention allocated to the critical association during the planning versus learning phase. In the traditional if-then planning condition, attentional resources were solely allocated to the critical association (presumably requiring cognitive capacity). However, in the associative-learning condition, participants merely *observed* the critical association among other irrelevant information (presumably requiring and investing little cognitive capacity). Thus, the Papies et al. findings suggest that both procedures produced mere associations. However, the typical implementation intention planning procedure that presumably required more cognitive capacity produced a much stronger association than the associative-learning condition requiring less cognitive capacity.

It is unfortunate that the process of making an if-then plan is still a widely neglected part of research on if-then planning, possibly because this inner speech (i.e., "thinking") is such a common aspect of our conscious experience that we take it for granted. Still, it seems safe to say that planning by formulating an if-then action plan requires a certain amount of cognitive capacity. This assumption calls for investigating the planning phase of if-then planning more thoroughly, for example, by investigating whether planning effectiveness is reduced by very low and very high levels of arousal or high or low levels of cognitive load during the planning phase.

Action Phase

The inner or self-directed vocalization of an if-then plan has behavioral consequences (reviewed by Gollwitzer & Sheeran, 2006), and abundant research has focused on the action initiation elicited by if-then planning. This research shows that the action specified in an if-then plan is initiated quickly (e.g., Cohen, Bayer, Jaudas, & Gollwitzer, 2008), independent of cognitive capacity (e.g., Brandstätter et al., 2001), and without requiring another conscious intention (e.g., Bayer et al., 2009). This evidence does not imply that all of these features

are necessarily present in any instance of if-then planned action initiation. The action of buying an apple in the cafeteria, for instance, can still be considered a consequence of if-then planning, even if it is initiated in the presence of a conscious intention. That said, the features of automaticity demonstrated in prior research can all be observed, with the degree of automaticity depending on the constraints set by the intended action and the critical situation. Thus, if-then planned action exhibits the characteristics proposed for processes of the impulsive system, which are usually conceived of as automatic in the sense of being fast, independent from conscious thought, and requiring little cognitive capacity.

In sum, the major strength of if-then action planning is that the capacity-intensive part—the planning—can be done at a non-critical point in time when capacity is available (e.g., while brushing your teeth in the morning) and the "automaticity" features of the initiated action ensure that the action is initiated even if cognitive resources are low in the critical situation (e.g., when discussing work with a colleague while entering the cafeteria). In other words: planning when relaxed will guide you when you're taxed.

Precursors and Execution of Behavior (RIM Theses 5 and 6)

Whereas behavior resulting from the reflective system is a consequence of a decision "that is guided by the assessment of a future state in terms of its value and the probability of attaining it through this behavior," in the impulsive system "behavior is elicited through the spread of activation" (Strack & Deutsch, 2004, p. 229). Both of these pathways eventually use so-called behavioral schemata. A behavioral schema is an associative cluster of frequently co-occurring motor activation patterns, the current situation (i.e., perceptual conditions), and the motor consequences (i.e., perceptual consequences). If one part is activated (e.g., perception of the current situation or perception of the consequences), the activation will spread to the associated parts (e.g., habits; Wood & Neal, 2007; action–effect principle; Elsner & Hommel, 2001; Kohler et al., 2002).

Let us apply these features to the case of if-then planning. If-then planning is based on a goal decision (e.g., eating more healthy food) that can be conceived of as the result of reflectively assessing a future state in terms of its value and probability. However, constraints of everyday life often do not allow for implementing a respective goal-directed behavior immediately (e.g., if the decision is made when no food options are available). Thus, instead of activating an appropriate behavioral schema immediately, the representation of the critical situation and the representation of the motor action are co-activated to either form or strengthen the association between them. When perceiving the critical situation, the new association increases the likelihood of activity spreading to the intended action, which increases the likelihood of its occurrence. Thus, if-then action planning may constitute a special case in which both systems work together to overcome the temporal gap between consciously being aware of one's goal

and the point in time when a critical goal-directed behavior is required. This process utilizes the advantages of both systems. First, even a new goal that arises from processing new information (e.g., "chocolate muffins contain so much fatty oil; I should stop eating them") can be pursued; though the novelty of the goal means goal-supporting habits could not have been formed previously. Second, the temporal gap before a respective behavior can be implemented can be bridged without continuous, conscious monitoring.

Relations Between Elements (RIM Thesis 4)

According to the RIM, two types of relationships underlie the two systems. Semantic relationships underlie the reflective system and associative relationships underlie the impulsive system. Simply put, if-then plans do not require assumptions about semantic relations or truth values; if-then plans work with arbitrary situation-response links (e.g., "If I hear the low tone on the left side, then I'll press the right button especially fast"; Cohen et al., 2008). Thus, semantic relationships are not required to form an association by if-then plans.

However, findings from research on if-then plans correspond to the associative nature proposed for the impulsive system. For example, there is evidence that negations are not processed in the impulsive system (Deutsch, Gawronski, & Strack, 2006). Correspondingly, specifying a negation in the action part of an if-then plan can backfire by unintendedly activating the negated action (Adriaanse, van Oosten, de Ridder, de Wit, & Evers, 2011). However, there are also unresolved questions. For example, it has been proposed that if-then planning creates something beyond a mere association between a critical situation and an intended action (Papies et al., 2009). Papies et al. suggest that what goes beyond mere associations in their study is a "grounding" (e.g., Barsalou, 2003; Paivio, 1986) of the action plan into the sensorimotor system, which may enhance its consolidation. In general, we agree with such a proposition and we have discussed related ideas about the role of sensory and motor brain areas in if-then planning (Martiny-Huenger et al., 2015). However, we question whether the core of such a proposition really concerns mechanisms that "go beyond" mere associations. The proposition rather seems to concern the question of *what* associations are and *where* they are located. "Associations" (in social psychology) usually refer to something rather abstract like a link between two or more mental representations. The proposed consolidation in the sensorimotor system may be a more concrete and physiologically grounded description of where to find concepts and associations between them (see Barsalou, 1999, 2008). The if-then format may be most effective in allocating attention solely to the important aspects (i.e., critical situation followed by intended action) to create a very strong or strongly consolidated association.

In sum, whereas semantic relations between elements are irrelevant for understanding if-then action planning, characteristics assumed to underlie the impulsive system are in line with empirical evidence related to if-then action

planning. However, there are open questions that are especially relevant for understanding if-then action planning. For example, what are the differences between associations created by repeated co-occurrence and those created by mere thought, as it is the case in action planning?

Parallel (but Asymmetric) Operation (RIM Thesis 2)

The reflective and impulsive systems are proposed to operate in parallel. However, whereas the impulsive system is engaged continuously, the reflective system can be engaged or disengaged at different points in time. This thesis opens a practical self-regulation problem that can be addressed by planning. There is evidence that different decision situations are best met with either more intuitive (IS) or deliberative (RS) decision styles. For example, when choosing a picture for one's living room, one is probably better off with an intuitive-based decision than conscious deliberation (Wilson, et al., 1993; Wilson & Schooler, 1991). When deliberating, a single dominant argument in favor of a certain picture ("this postmodern style makes me appear intellectual") may not be in line with the factors that actually determine our liking of the picture when passing by it in our living room on a day-to-day basis. In other situations, affective and habitual processes (IS) may pull us in the wrong direction (e.g., when standing in front of the cake shelf in a bakery when we have the general goal of healthy eating). In such a situation, this one single dominant argument when deliberating ("this is not healthy," RS) may be beneficial for achieving our goal. The problem in the latter case is to engage deliberation in time to overcome the immediately available but undesirable impulsive response. This sounds like a self-regulation problem that could be overcome by appropriate planning. As we suggested earlier (Martiny-Huenger, Thürmer, Issa, & Gollwitzer, 2011), instead of planning specific responses, action planning might even be used to automate the initiation of an outcome-open deliberation process.

We (Doerflinger, Martiny-Huenger, & Gollwitzer, 2016) recently tested this in three "escalation of commitment" paradigms (Sleesman, Conlon, McNamara, & Miles, 2012). Escalation of commitment can be conceived as continuing a course of action despite information that the current course is failing. Beside others, motivational factors like self-justification and self-presentation have been identified to drive people into escalation of commitment (Sleesman et al., 2012). We reasoned that planning to deliberate would increase the consideration of (negative) feedback and decrease escalation of commitment. We found evidence for this hypothesis in a study modeled after a classic escalation of commitment paradigm (Staw, 1976). Participants made an initial decision on which of two divisions of a hypothetical company would receive a significant amount of additional funding. Our dependent variable was the amount of additional investment in a second budgeting decision after receiving feedback that the productivity of the initially chosen division either increased (positive feedback) or decreased despite the investment

(negative feedback). Continuing or even increasing investment into the initially selected division in the negative feedback condition is evidence for a failure to disengage (e.g., Staw, 1976). In line with our hypothesis, participants committing to the plan "If the situation looks unfavorable, then I will deliberate thoroughly!" prior to the task invested significantly less money in the failing division (negative feedback condition) compared to all other conditions (positive feedback and no plan condition). Thus, when the situation was unfavorable, participants with a deliberation plan showed less escalation of commitment.

In the two additional studies, we replicated this finding in a more naturalistic setting with real monetary consequences of the participants' decisions, using an adaptation of Texas Hold'em poker. A round of the game could only be won by repeated investment in new cards. If the chances of winning were high (as indicated by a comparison of one's own and the computer-opponent's cards), continuing to invest to get the final reward was an easy choice. However, if the chances of winning were low, participants were confronted with the decision to either continue to invest (thus betting on the small chance of getting the full reward) or to bail out of the current round and thus accept a sure loss (i.e., only lose previously invested money and receive no reward).

In these studies, we compared the deliberation plan from Study 1 with a plan facilitating spontaneous responses: "If the situation looks unfavorable, then I will respond quickly and spontaneously!" In line with escalation of commitment research, after initially deciding to continue to play with the current cards, participants in general tended to continue to invest even if the likelihood of losing was higher than 50 percent. However, this tendency was less pronounced for participants with a deliberation plan. They bailed out earlier from a *losing* game than participants with a spontaneity plan, especially later in each round when the investment for a new card was high. Thus, whereas research on if-then planning usually is about planning very specific behaviors, these results indicate that a deliberation process (i.e., engaging the RS) can be initiated at a pre-planned point in time by if-then planning.

Supporting evidence for this conclusion is also provided by another study (Bieleke, Gollwitzer, Oettingen, & Fischbacher, 2016) in the domain of inter-personal interactions. Participants committed to an intuition plan or deliberation plan, similar to those presented in the previous study, before deciding to accept or reject a series of ultimatum offers, among them several low (unfair) offers. Unfair ultimatum offers are often rejected, a decision that has been related to affective processes such as feelings of anger or spite (e.g., Pillutla & Murnighan, 1996; Yamagishi et al., 2009). We expected responses to unfair offers to depend on whether participants planned to deliberate or to rely on their intuition, as this should attenuate versus amplify, respectively, the role of affective processes.

In line with our hypothesis, making these plans affected the responses to unfair offers, which were more likely to be accepted in the deliberation than the intuition condition. This effect was further moderated by participants' social value

orientation (Murphy & Ackermann, 2014), a simple measure of prosociality that we had assessed prior to the experiment. Prosocial individuals were much less likely to accept unfair offers than proself individuals when they planned to make intuitive decisions, whereas both prosocial and proself individuals accepted similarly high shares of unfair offers in the deliberation condition. Considered jointly with the escalation of commitment studies, these results suggest that both the IS and the RS can be engaged with if-then plans, with meaningful consequences on information processing and decision making.

Interim Conclusion

We hope to have provided a thorough discussion of if-then action planning. Furthermore, applying different aspects from the RIM dual-system framework (Strack & Deutsch, 2004) to implementation intentions has helped us to identify aspects that may need more systematic investigation. Most importantly, it seems that the action initiation following if-then planning has been investigated extensively (reviewed in Gollwitzer & Sheeran, 2006). However, only a few studies (e.g., Knäuper et al., 2009; McFarland, & Glisky, 2012) have directly investigated different ways of presenting if-then plans; not differing in content (e.g., different "if" or "then" parts) but in how the content is presented (e.g., verbal versus mental imagery). Whether an action plan is presented in verbal form on a piece of paper, or whether participants are instructed to memorize it, repeat it by inner or self-directed speech, or accompany it with mental imagery so far seems to depend on the researcher's individual preferences. In the second part of the chapter, we will turn to the question of whether the mechanisms of strategic action planning can be used to help us understand how our behavior is shaped by processing "if-then plan"-like formats in more incidental ways.

Spontaneous Thought in an If-Then Plan Format and Action Control

Implementation intentions are usually introduced and used as a self-regulation tool. Participants in experiments and users in everyday life are instructed on how to strategically form if-then plans to improve their goal striving. In this second part of the chapter, we will explore an additional aspect of thought in an if-then format that we believe may constitute a basic mechanism of human action control. Habits are one important determinant of behavior. The consistent pairing of a behavior and a certain situation increases the likelihood of exhibiting this behavior again in this situation (reviewed by Wood & Neal, 2007). We propose that actual perception and actual behavior are not required for behaviors and situations to be paired, but that "spontaneous" conscious thought in an "if-then plan"-like format may also fulfill a similar function. That is, spontaneous thought of a situation followed by an (intended) action may increase the likelihood of actually executing the behavior,

even if this plan-like thought was not explicitly intended. By "spontaneous" we mean that the if-then format of thinking about an action in the future is not instructed or knowingly used as a self-regulation tool but rather occurs incidentally within one's stream of thought (internal source) or through communication with another person (external source). To explain this in detail, we will first give two examples of spontaneous thought in an if-then format, and then summarize one of the first implementation intention studies, which happens to also be one of the few studies that investigated such spontaneous if-then plans (Gollwitzer & Brandstätter, 1997, Study 1). Finally, we will describe an implication of this view for the scientific investigation of so-called controlled processes.

External Source

Imagine you are in an unfamiliar city and you are looking for the closest subway station (your goal). When asking someone for directions, you may receive an answer similar to "Go straight ahead and *when you pass by the corner cafe, then turn right*" (if-then format). Thus, whether repeating this in your head or not, when listening, you are processing an if-then action plan. All the features of an if-then planning phase are in place in such a situation: the superordinate goal of going to the subway station is active and a verbally formulated critical situation (corner cafe) followed by a goal-relevant action (turning right) is processed with your full attention. Thus, given the existing research on how if-then planning leads to performing the intended action, would the mechanisms that lead to the goal in this mundane situation differ from strategically used if-then planning? The differences, in our view, involve only the degree to which various aspects (e.g., goal strength, alternative actions, and attention to the plan) contribute to the action initiation. For example, the find-the-subway and the cafeteria example may vary in the strength of alternative responses available for the critical situations. Accordingly, the necessary effort in processing the if-then plan to create a sufficient situation-action association to initiate the intended action may vary, too. Such differences pertain to the degree of the contribution of different aspects of the mechanism, however, not to differences in the mechanism itself.

Internal Source

Besides receiving an "if-then"-like plan from someone else, thought in an if-then format may happen naturally during mind-wandering (e.g., Smallwood & Schooler, 2006). Imagine you are brushing your teeth in the morning. Your mind is wandering and you suddenly imagine your office, followed by the thought to write an e-mail to a colleague. Although you did not have this thought intentionally, it may still reflect your previously held goal to send an email to the colleague. In the words of Smallwood and Schooler (2006; Baird, Smallwood & Schooler, 2011), mind-wandering (without being explicitly aware) takes your focus

away from the current task (e.g., brushing your teeth) to a relevant goal and personally relevant and familiar anticipated situations and actions (e.g., office, writing an e-mail). Considering the simple format of if-then action plans, it is possible that mind-wandering content sometimes consists of "if-then plan"–like thought, such as thinking about the office and writing an e-mail. Furthermore, it is conceivable that the likelihood of such content varies with one's commitment to the goal; more commitment may mean that one's thoughts more often revolve around that goal, resulting in incidentally encountering more "if-then plan"–like content and thus creating more goal-relevant situation-behavior links. These spontaneous "if-then plan"–like thoughts may increase the strength of the association between the situation and the action and thereby increase the likelihood of the action's occurrence in the respective situation—again, by the same mechanism as strategic if-then planning.

Empirical Evidence

There is one study that investigated "spontaneously" occurring if-then plans comparable to the internal-source example. Gollwitzer and Brandstätter (1997, Study 1) asked students prior to Christmas break about two goals they were committed to completing during the holidays and then checked for completion after the holidays. Furthermore, before the holidays, they asked whether participants had thought about specific situations in which they could implement certain behaviors in order to reach these goals. Thus, they probed for specific thoughts that linked goal-directed actions to critical situations (i.e., if-then plan-like content) that the participants came up with by themselves without being aware of the effect of if-then planning. Did the occurrence of such thoughts positively predict whether the goals were actually completed? They did, especially for difficult goals. For participants who indicated prior to the holidays that they had *not* thought about specific situations in which to implement goal-directed behaviors, the completion rate for difficult goals was only 22 percent. However, participants indicating that they had "if-then plan"–like thoughts, the completion rate was significantly higher (62 percent). In general, this study indicates that if people think in an if-then format about goal-related future actions (intentionally or unintentionally), they are more likely to complete these goals. Investigating such naturally occurring if-then plans had the weakness that it was only correlational. Thus, subsequent research manipulated if-then planning in order to establish the causal effects of the planning process on actions and introduced if-then planning as a self-regulation strategy. This direction has dominated subsequent research as strategic self-regulation is an important aspect in many domains (e.g., health). However, the contribution of if-then plan mechanisms to more naturally occurring action control and goal striving may be worth further investigation, especially as they provide a very simple set of mechanisms that could potentially be applied to a wide range of situations.

Controllability and Automaticity

Finally, we want to discuss briefly one implication of our spontaneous-planning perspective for research dealing with the automaticity-controlled dimension of dual-system models. The (un)controllability of a certain mechanism has been used as an indicator of whether the mechanism is "automatic" or not (Bargh, 1994). However, our current perspective of how action planning results in stimulus-elicited automatic action initiation presents a problem for identifying "control" in an experiment. Empirical tests of whether a mechanism is controllable often involves instructing participants either about the mechanisms behind a targeted process or about a specific way of responding to influence the target process (e.g., Degner, 2009; Teige-Mocigemba & Klauer, 2013). Such instructions increase the likelihood of "if-then plan"-like thought prior to the task. As a consequence, the actions that subsequently influence the target process are themselves not controlled *in situ* but rather automatic. However, what conclusions can be drawn about the automaticity of a target process by empirical evidence that it can be influenced by another automatic process? Such evidence provides valuable information about implicit measurements and the question of whether they can be faked (e.g., Degner, 2009; Teige-Mocigemba & Klauer, 2013). However, insights on the automaticity-controlled dimension become more problematic when considering that not only habitual actions are initiated automatically *in situ*, but also actions resulting from prior thought in an if-then format.

Conclusion

In the current chapter, we presented action planning in an if-then format as a means by which conscious thought translates into automatic action. We approached if-then planning from a dual-system framework perspective and explicated how the planning part of if-then planning is a conscious, controlled process, whereas the action initiation part is fast and efficient. Thus, the controlled aspects of our actions may often lie not at the point in time in which the action is initiated, but in prior thought. These prior thoughts that drive our actions may have strategic origins or they may be more spontaneously induced during mind-wandering or communication with others. This perspective provides a simple mechanism to explain human behavior ranging from the strategic self-regulation of newly acquired goals to the spontaneous associations of situations and actions relevant to habitually pursued goals. Furthermore, in experimental settings, we propose that processing instructions is not solely the process of memorizing them so that they can be retrieved from memory later and translated into behavior *in situ* (i.e., during the task). Rather, we argue that processing instructions in the planning phase is the immediate translation of the plan into respective behavior in a covert or simulation-like fashion (see Jeannerod, 2001; Martiny-Huenger et al., 2015) with the consequence that the *in situ* action can have automaticity-

like qualities. In sum, "if-then plan"-like thought may have much broader implications than solely being an important self-regulation tool for attaining difficult goals (e.g., eating more healthy)—the mechanisms identified by if-then planning may play an important role in human action control in general and provide mechanisms of conscious, deliberate action control without running into a homunculus problem. In practical terms it all comes down to: Planning when relaxed will guide you when you're taxed.

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