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Intentional Action Control in Individuals and Groups

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How do we translate our intentions into actions? The psychology of action approach (e.g., Gollwitzer & Bargh, 1996; Hommel & Nattkemper, 2011; Lewin, Dembo, Festinger, & Sears, 1944) applies psychological theories on cognition and motivation to the investigation of behavior in order to develop answers to this question. In this contribution, we examine the origins of the psychology of action that have inspired our current approach to intentionality, our definition of goal intentions, and our epistemology. We will then introduce implementation intentions, a related type of intention that also contributes to the intentional control of action during goal striving, but that relies on different processes than mere goal intentions. Building on the conceptual distinction between goal intentions and implementation intentions, we will then review the empirical evidence demonstrating the difference between action control by goal intentions and implementation intentions.

The Psychology of Action

The pioneers in psychology who set out to analyze the concept of willful action (e.g., James, 1890, Chapter 26) laid the groundwork for the empirical investigation and refinement of theories on intentionality. In this endeavor, the behaviorists took a very restricted perspective on human action control (e.g., Hull, 1951). Ignoring the concept of subjective intentions in order to maximize experimental control, they defined goals merely as (external) outcomes that create approach behavior (e.g., a food pellet for a rat). This definition narrows potential lines of research to the description of an organism's behavior in relation to external stimuli. Eventually, the cognitive revolution in psychology allowed the development of a more elaborate concept of intention and its determinants. Tolman (1932, 1952), a neobehaviorist, as well as the cognitive social learning theorists (Bandura, 1977b; Mischel, 1973), broadened the definition of intention by including subjectively defined outcomes and behaviors. They postulated that various mental representations and processes mediate the

relation between environmental stimuli and observable behavior. This reasoning created the basis for the current understanding of goals. These days, goals are defined as internal representations of desired (internal or external) end states that one is committed to achieve (Ryan, 2012). Goals are formed to guide cognition, emotion, and behavior over time and even in the face of obstacles. Having set oneself a goal thus means that one has formed the intention to pursue a specified desired outcome or engage in a certain behavior (*I want to attain outcome X! I want to engage in behavior Y!*).

The psychology of action approach further distinguishes between the formation of a goal intention, referred to as *goal setting*, and the translation of the goal intention into action, or *goal striving* (see also the similiar concepts of *goal shifting* and *rule activation* in cognitive psychology; Rubinstein, Meyer, & Evans, 2001). This distinction between goal setting and goal striving is important to the psychology of action, as the two types of phenomena are governed by different principles: Goal setting is controlled by motivational principles, while goal striving is controlled by volitional principles (Gollwitzer & Oettingen, 2012).

The decision to set a goal intention (i.e., choosing a desired endstate to strive for) is commonly assumed to depend on both the desirability and the feasibility of a certain outcome (e.g., Fishbein & Ajzen, 2010). Goals are most likely to be set when the anticipated endstate is subjectively evaluated as both desirable (*I want X!*) and feasible (*I am confident that I can achieve X!*). Thus, from a psychological perspective, a strong desire to attain a goal is not sufficient for the formation of a goal intention; in addition, one must be confident that the chances of attaining the goal are high. Research on goals has determined the boundary conditions under which goals are more easily achieved. For example, the strong belief that the goal-directed action can successfully be performed (Bandura, 1977a) and the perception that the endstate (i.e., the goal outcome) is highly desirable (i.e., to have a high expected value; Fishbein & Ajzen, 1975, 2010) have been found to promote goal attainment.

Goal striving, on the other hand, is concerned with progress towards the desired endstate (How does one strive for the goal?). Once a goal has been set, implementing the goal intention (e.g., by selecting the appropriate means of action) is the primary concern. Goal striving thus involves the process of translating a goal intention into action, up to the attainment of or disengagement from the respective goal. Goal striving draws on *self-regulation*, which is defined as a person's ability to guide his or her behavior over time and across various situational contexts in the process of goal attainment (Karoly, 1993).

From a psychology of action perspective, intentional action control thus relates to an individual's self-regulatory ability to modify his or her actions in order to attain a goal (i.e., translating a goal intention into actions that reduce the discrepancy between the current state and the desired endstate). For instance, strong commitment to the goal to be well prepared for an upcoming test might enable a student to spend the evening studying for the test instead of accepting a spontaneous and tempting invitation from friends to go out for drinks. Importantly, intentional action control is not restricted to conscious control processes, but also extends to unconscious control processes that function outside of conscious awareness (i.e., automatically; e.g., Gollwitzer, Parks-Stamm, & Oettingen, 2009).

A comprehensive framework that informs our understanding of intentional actions is the Rubicon Model of Action Phases (Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987) that describes the processes that occur during goal pursuit, from setting a goal to achieving it. The Rubicon Model of Action Phases conceptualizes goal pursuit as a definite series of steps. According to the model, goal pursuit is carried out in four successive action phases: the pre-decisional, the pre-actional, the actional, and the post-actional phase. The pre-actional and actional phases pertain to goal implementation; these phases are framed by the pre-decisional phase and the post-actional phase, which involve goal choice and the evaluation of goal progress, respectively. As a descriptive theory, the Rubicon Model of Action Phases has inspired two process theories: mindset theory (Gollwitzer, 1990, 2012) and implementation

intention theory (Gollwitzer, 1999); the present contribution focuses on the latter. In order to provide a thorough introduction to implementation intention theory, we will now briefly summarize the methodological underpinnings of the current psychology of action in general and of our research in particular.

The Methodology of the Psychology of Action

Methodologically, current research on the psychology of action follows a quantitative empirical epistemology that acknowledges its roots in both the natural sciences and the humanities. This methodology formalizes in theory specific aspects of human action, derives hypotheses, and tests these hypotheses experimentally (i.e., in the laboratory under controlled conditions). At first sight, this methodology might seem laborious and unremarkable (our laboratories are simply rooms equipped with ordinary personal computers); however, unlike correlational or non-empirical approaches, it allows conclusions about causality to be drawn (e.g., Rubin, 1974) and enables rigorous investigation of the processes underlying human action. In this endeavor, researchers are not confined to a particular set of paradigms but use methods and concepts from a variety of disciplines including social psychology (e.g., mimicry; Wieber, Gollwitzer, Sheeran, & Schoch, 2012; group interaction; Thürmer, Wieber, & Gollwitzer, 2012; Wieber, Thürmer, & Gollwitzer, 2012), neuroscience (e.g., MEG measurement; Achtziger, Fehr, Oettingen, Gollwitzer, & Rockstroh, 2009), cognitive psychology (e.g., Simon task; Cohen, Bayer, Jaudas, & Gollwitzer, 2008), developmental psychology (e.g., pre-school children's self-control; Suchodoletz, Trommsdorff, Heikamp, Wieber, & Gollwitzer, 2009; Wieber, von Suchodoletz, Heikamp, Trommsdorff, & Gollwitzer, 2011), and clinical psychology (e.g., schizophrenic patients; Brandstätter, Lengfelder, & Gollwitzer, 2001) to test our hypotheses. The rigor of laboratory experiments allows firm conclusions to be drawn, and the focus on social context variables and the plurality of paradigms supports the application of these conclusions to real-world settings. In other words, the constructs investigated in the psychology of action (e.g., planning) are

operationalized so that they can be experimentally manipulated, but these constructs can be extended to everyday situations of goal striving (e.g., Anderson, Lindsay, & Bushman, 1999).

For example, in an experiment designed to examine the effects of planning on goal striving, the participants were randomly assigned to either a planning condition or a no-planning control condition before beginning work on an anagram task. Participants were asked to carefully read the task instructions and to follow these instructions closely. As the operationalization of plan formation relied on the participants' conscious information processing, we checked whether participants had indeed formed the assigned plans and intended to use them by asking them to recall their plan at the end of the study and to indicate their self-reported commitment to the plan. Following the planning manipulation, we measured how long participants persisted at working on a difficult anagram task as an indicator of the extent of their goal striving. Because all other factors were held constant and participants were assigned to conditions at random, any differences between the planning and no-planning conditions that could be observed were likely to stem from the planning manipulation. This methodology has not only helped us to generate and develop our theoretical accounts, but also to systematically test hypotheses derived from our theories in order to refine our empirical understanding of the psychology of action.

We believe that this experimental approach can be of great value to researchers from neighboring disciplines. Other empirical researchers in more applied fields (who generally rely on correlational field studies and field experiments) might be interested in the underlying processes at work and in obtaining more conclusive evidence of the causal direction of the relationships in their constructs (e.g., Anderson et al., 1999). Non-empirical researchers who rely on theoretical arguments might wish to confirm whether or not their arguments are in accordance with empirical observations. This could be of particular interest when more than one theoretically sound solution has been proposed. As researchers in the psychology of action, we also greatly profit from cooperation with neighboring disciplines that enables us to

explore the relevance of our findings in applied contexts and possible obstacles that might hinder successful goal striving; in addition, we benefit from receiving valuable feedback on our theoretical reasoning. All of these factors help to advance our theories and concepts, as the interdisciplinary research discussed later in the article will demonstrate. Before reviewing these empirical findings, we will introduce the specific type of intention that is central to our research.

Goal Striving and Implementation Intentions

Setting goals (i.e., forming goal intentions) is not always sufficient to ensure their implementation (e.g., Armitage & Conner, 2001). Despite having formed strong goal intentions (as indicated by high levels of goal commitment and motivation), people frequently fail to strive for these intentions effectively; in other words, there is a gap between people's goal intentions and their behavior. Consequently, the implementation of goal intentions (goal striving) needs to be addressed. Here, a second type of intention has been proposed to support goal intentions: implementation intentions (Gollwitzer, 1999). Almost eighty years ago, Ach (1935) asserted that the anticipation of a situation and an intended behavior creates what he referred to as determination. Ach maintained that this determination urges a person to initiate the behavior once the situation has been encountered; the specificity of the situation and the intensity of the intention determine the strength of the determination. Building on this foundation, implementation intention theory (Gollwitzer, 1999) distinguishes goal intentions (*I want to achieve X!*) from implementation intentions (*And if situation Y occurs, then I will perform behavior Z!*). The formation of an implementation intention thus refers to a commitment to strive for a goal in reaction to the situation specified in the if-part, using the linked response spelled out in the then-part. Implementation intentions are always formed as an addition to a goal intention and can thus be considered subordinate plans. They provide a partial answer to the question of how to translate intentions into actions and thus achieve goals. Ever since its inception in the 1990s, this concept has attracted a great deal of attention.

Research has consistently shown that forming implementation intentions (Gollwitzer, 1999; Gollwitzer & Sheeran, 2006) facilitates goal striving and thereby effectively bridges the gap between people's goal intentions and their behavior.

Mediating Processes

Implementation intentions facilitate goal attainment on the basis of *psychological mechanisms* associated with the specified situation in the if-part and the mental link forged between the if-part and the specified goal-directed response described in the then-part of the plan (Gollwitzer & Oettingen, 2011). By selecting an anticipated critical situation and including it in the if-part, the mental representation of this situation becomes highly activated and consequently more accessible. This heightened accessibility of the if-part of the plan has been observed in several studies using a variety of experimental tasks (e.g., cue detection, dichotic listening, cued recall, lexical decision, flanker; e.g., Aarts, Dijksterhuis, & Midden, 1999; Achtziger, Bayer, & Gollwitzer, 2012; Parks-Stamm, Gollwitzer, & Oettingen, 2007; Webb & Sheeran, 2007; Wieber & Sassenberg, 2006). In addition to heightening the activation (and thus the accessibility) of the mental representation of the situational cue specified in the if-part, the structure of the implementation intention also forges a strong associative link between the mental representation of this cue and the mental representation of the specified response. These associative links seem to be quite stable over time (Papies, Aarts, & de Vries, 2009) and they enable activation of the mental representation of the specified response (the then-component) by the presence of the specified critical situational cue described in the if-component (Webb & Sheeran, 2007). Mediation analyses suggest that both cue accessibility and the strength of the cue-response link together mediate the impact of implementation intentions on goal attainment (Webb & Sheeran, 2007, 2008).

As a consequence of the strong associative links between the if-part (situational cue) and the then-part (goal-directed response) that are created by forming implementation intentions, both the detection of the situation and the initiation of the goal-directed action

exhibit features of automaticity. These features include immediacy, efficiency, and redundancy of conscious intent. Thus, formation of an implementation intention allows individuals to act *in situ* without deliberating over whether or not to act. Indeed, empirical evidence shows that if-then planners act more quickly (e.g., Gollwitzer & Brandstätter, 1997), deal more effectively with cognitive demands (i.e., speed-up effects even when under high cognitive load; e.g., Brandstätter et al., 2001), and do not need to consciously decide to act in the critical moment. Consistent with this last observation, the effects of implementation intentions are detected even when the critical cue is presented subliminally or when the respective goal is activated outside of conscious awareness (Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009; Sheeran, Webb, & Gollwitzer, 2005).

The processes underlying implementation intention effects (enhanced cue accessibility, strong cue-response links that automate reactions) help if-then planners to readily identify and take advantage of good opportunities to make progress toward their goals. Forming an if-then plan thus strategically automates goal striving: People can intentionally delegate the control of goal-directed actions to preselected situational cues by forming if-then plans. Support for this strategic automation hypothesis has been provided by a recent functional magnetic resonance imaging (fMRI) study on the processes underlying the effects of implementation intentions. By forming implementation intentions, participants in the study were able to enhance their prospective memory performance (i.e., they remembered to initiate the intended action at the appropriate time with greater success); the associated brain activation showed that this increase in performance was due to a switch from top-down action control by goals to bottom-up action control by the situational cues specified in the participants' implementation intentions (Gilbert, Gollwitzer, Cohen, Oettingen, & Burgess, 2009). Overall, research has demonstrated that action control by implementation intentions is characterized by automatic processes and thereby differs from action control based on mere goal intentions, which relies on goal commitment as a resource to initiate effortful goal-

directed behavior in appropriate situations. We will now briefly summarize previous research findings on variables that moderate the effectiveness of implementation intentions before discussing in depth our most recent research on the effectiveness of implementation intentions for individuals and groups.

Moderating Variables

In general, the effectiveness of implementation intentions has demonstrated resistance to detrimental self-states, such as the presence of thoughts and feelings of self-doubt (Achtziger, Gollwitzer, & Sheeran, 2008; Bayer & Gollwitzer, 2007; Gollwitzer, Bayer, & McCulloch, 2005). However, several factors have been identified that are prerequisites for the effective application of implementation intentions.

With respect to the superordinate goal intention, four aspects have been shown to affect performance. First, the commitment to both the superordinate goal intention and to the implementation intention must be high for implementation intentions to benefit goal striving (e.g., Sheeran et al., 2005, Study 1). Second, the superordinate goal intention must be activated for implementation intention effects to occur (e.g., Sheeran et al., 2005, Study 2). Third, goal difficulty must be medium or high, presumably because strong goal intentions are sufficient to successfully guide goal striving when the goal difficulty is low (e.g., Gollwitzer & Brandstätter, 1997; Hall, Zehr, Ng, & Zanna, 2012). Fourth, goal-related self-efficacy (i.e., the belief that one is able to successfully perform the goal-directed actions) must be high for implementation intentions to facilitate goal striving (Wieber, Odenthal, & Gollwitzer, 2010).

Concerning the implementation intention itself, implementation intentions have been found to function best when the if-component specifies a situation that is easy for the person to identify (Gollwitzer, Wieber, Myers, & McCrea, 2010; Wieber, Harnack, & Gollwitzer, 2012). High identifiability is conceptualized as a correspondence between the abstractness of the stimulus specification in the if-part of the implementation intention and a) the abstractness of the stimulus provided by the environment and b) the abstractness of the stimulus

specification preferred by the individual concerned. For example, in one study, the participants' task was to decide whether a word on the computer screen denoted a vehicle or an animal. Planning the goal to respond especially quickly to animal words using the implementation intention to immediately press the "animal" key in response to a black bird sped up participants' responses to black birds, but not to more abstract stimulus specifications of birds and animals.

With regard to situational factors, implementation intentions have been shown to work best when people are in a how-mindset (i.e., deliberating about how to achieve a goal) rather than in a why-mindset (i.e., deliberating about why a goal is important) before they encounter the situation specified in the implementation intention. For example, implementation intention participants identified critical stimuli faster in a dual-task paradigm after they thought about how they would form and maintain personal relationships in the preceding task, but not after they thought about why they would form and maintain personal relationships (Wieber, Gollwitzer, & Sezer, 2012). It has also been determined that feedback on the progress of the goal striving is required in order for people to disengage from the implementation intention when it has turned out to be ineffective (Gollwitzer et al., 2008; Jaudas, 2011). For example, in a study conducted by Jaudas (2011), the participants' goal was to find the shortest way through a number of mazes. In each trial of the maze task, they were provided with a hint (i.e., an arrow pointing to the left or to the right) that was either correct (in 8 out of 15 trials) or incorrect (in 7 out of 15 trials). Implementation intention participants formed the plan to follow the hint; when they received performance feedback (indicating that their strategy was flawed), they performed at the same level as mere goal intention participants with feedback. When implementation intention participants did not receive performance feedback, however, they performed worse than goal intention participants (with and without feedback).

In terms of personality traits, the trait of conscientiousness might be another factor that moderates the effects of implementation intentions. In a recent study, implementation

intentions increased school attendance in students exhibiting low conscientiousness, but not in highly conscientious students (Webb, Christian, & Armitage, 2007). However, these results do not allow us to conclude that implementation intentions do not work for highly conscientious people, as the highly conscientious students showed up to class even without the implementation intention (i.e., a ceiling effect occurred that left little room for further improvement).

In summary, research on implementation intentions has determined certain conditions under which individuals can benefit from furnishing their goal intentions with implementation intentions. However, neither individual action control by implementation intentions in social contexts (i.e., individuals striving for their goals in interpersonal contexts) nor collective action control by implementation intentions (group members striving for a common goal) have been researched in depth. We therefore set out to fill this gap; the results of our recent research on this theme are summarized in the remainder of this article. We will present two lines of research that address action control in social contexts and in groups, respectively. These studies have tested whether or not implementation intentions are more effective than mere goal intentions in improving individual and collective action control in these settings. Our interest was twofold: First, we hoped to gain insights into the mechanisms underlying implementation intention effects. Second, we sought to provide relevant knowledge for practitioners who want to develop effective implementation intention interventions.

Intentional Action Control in Individuals: Regulating Social Influence

A person's behavior is easily influenced by his or her social environment (e.g., Turner, 1991), even when such influences interfere with higher-order goal intentions. First evidence suggests that implementation intentions are effective at moderating unwanted social phenomena. For instance, some people are afraid of social evaluation (i.e., they suffer from social anxiety), and thus underestimate their performance in social tasks (e.g., giving a speech) because they pay too much attention to physiological markers indicative of their

anxiety (e.g., sweaty palms) and infer poor performance. Webb and colleagues (Webb, Ononaiye, Sheeran, Reidy, & Lavda, 2010, Study 4) asked participants to give a speech to be recorded and shown to other participants. In two experimental conditions, highly socially anxious participants learned about a strategy for dealing with their anxiety, namely that they should not worry about evaluations. Some participants furnished this goal with the implementation intention "If I feel concerned, then I will focus on the back wall of the room!" Moreover, in two control conditions, participants either high in social anxiety or low in social anxiety did not receive any additional instructions. All participants then delivered the speech and rated their own performance. These ratings were later compared to those of independent raters who viewed videotapes of the speeches. As it turned out, the ratings of the independent raters were equally high across conditions but the self-ratings differed between conditions: Highly anxious control and goal intention participants evaluated their own performance worse than control participants low in social anxiety. However, self-ratings of highly anxious implementation intention participants were better than those of goal intention and control participants high in social anxiety, and did not differ from those of control participants low in social anxiety. Forming implementation intentions thus removed the negative effect of social anxiety on self-evaluations in a social task. In light of this promising first evidence, we sought to systematically investigate the effectiveness of implementation intentions in social contexts.

To this end, we chose two prominent social influence techniques that have been found to impact people's behavior outside of their conscious awareness: mimicry and the disclosure reciprocity norm in communication (see Bargh & Morsella, 2008). Our question was whether implementation intentions might be effective in modifying the impact that others can exert on individual goal striving. In other words, we investigated whether implementation intentions can increase or decrease the likelihood that people will strive for their goals in situations in which the social context interferes with their goals. In the following section, we will discuss our studies on individual action control in social contexts that have addressed this question.

Creating Pressure to Disclose Personal Information by Reciprocity

Wieber, Gollwitzer, Sheeran, and Schoch (2012) sought to test the limitations of goal intentions in shielding individuals from unexpected subtle social pressures to self-disclose personal information, and to determine whether implementation intentions would be effective in improving resistance to social pressure. Lynn Miller's classic studies show a strong social norm to reciprocate the self-disclosure of personal information made by one's communication partner (e.g., Collins & Miller, 1994). In interpersonal communication, for instance, the disclosures made by a conversation partner (e.g., that he finds it extremely difficult to motivate himself to study for important examinations) increase the likelihood that the other person will also self-disclose personal information, and to a greater extent than was intended before the communication began (e.g., Jourard & Jaffe, 1970). Although the reciprocal self-disclosure of personal information is helpful for the development of meaningful personal or intimate relationships (e.g., increasing positive affect in getting aquainted situations; Vittengl & Holt, 2000), there are circumstances that call for resistance to such social pressure to self-disclose. For instance, when a friend posts very personal information online on a social network platform, one should not reciprocate this high level of intimacy, as the information disclosed on most social platforms is difficult to control (e.g., it might be viewed by future employers).

In their self-disclosure study, Wieber and colleagues used a spontaneous conversation situation to test whether intentional action control by goal intentions versus implementation intentions can empower people to resist the self-disclosure reciprocity norm, even in unexpected situations. The study was publicized on the university campus as a "study on online-chatting." Female participants were tested in individual participant sessions in the behavior laboratory. After they had been welcomed and gave their informed consent, participants were told that the study would involve chatting with a student from a different university and that they would be trained for this chat. Each participant first read a newspaper

article on a recent case in which the private information of the users of a social network became publicly available on the internet due to a security leak. This information served to increase the awareness of the dangers of disclosing personal information and to strengthen the participants' motivation to protect their privacy.

Next, participants' intentions were manipulated in a "communication training" for the upcoming online-chat. Participants in the control condition read a text containing technical information about the chat-program and were asked to remember an excerpt from this text. Participants in the goal intention condition and the implementation intention condition, however, were asked to commit to the goal intention "I will not disclose any personal information!" Goal intention participants added a second, more specific goal intention "I will answer in generalities!"; implementation intention participants added the specific if-then plan "If someone asks for personal information, then I will answer in generalities!" Shortly after the participants had started to work on this training, another alleged participant (who was in fact a female student confederate) entered the room and also started to work on the questionnaire. After both the participant and the confederate had completed their questionnaires, the experimenter asked them to wait until their chat-partners at the other university were ready, which would unfortunately take about 15 minutes. Approximately one minute after the experimenter left the room, the confederate introduced herself to the participant and started a partially standardized conversation, which was recorded and served as the dependent variable. In this ostensibly spontaneous chat, the confederate first self-disclosed personal information on several topics to create the social pressure to reciprocate the disclosure before asking the participant for her point of view. The pre-tested conversation topics increased in the level of intimacy from topic one "what one likes about one's academic studies" to topic five "what are one's worries about the future".

This ostensibly spontaneous conversation was unobtrusively recorded, and participant responses were coded by independent raters who were blind to the experimental intention

conditions. Participants were asked for their consent to be voice-recorded before the study began (informed consent) and were asked for their permission to analyze the recordings after the study (debriefing); all participants agreed to both requests. The results confirmed our hypotheses: Goal intention participants self-disclosed as much personal information as the control participants, indicating that the intentional action control by goal intentions was not sufficient to empower participants to resist the reciprocity norm of self-disclosure. Implementation intention participants, however, self-disclosed less personal information than goal intention participants and control participants in this unanticipated conversation situation despite the normative pressure to reciprocate self-disclosure.

Creating Pressure to Spend Money Through Mimicry

In a further study, Wieber, Gollwitzer, Sheeran, and Schoch (2012) sought to test a different means of subtly creating social pressure: namely, mimicry. Mimicking another person when the mimicked person is unaware of the action has been shown not only to increase mimicked person's liking for and rapport of the mimicker (mimicry-liking effect; e.g, Lakin & Chartrand, 2003), but also to be an effective means of persuading the mimicked person (Tanner, Ferraro, Chartrand, Bettman, & Van Baaren, 2008). Consequently, the second study reported here tested the limits of intentional action control in the context of resisting a persuasive request to spend one's money. Building on previous findings that have established that mimicry increases liking and that people are more willing to comply with someone asking for a favor (e.g., purchasing an object) when they like the person making the request, mimicry was expected to threaten a goal to save money, as being mimicked should increase the likelihood that a person would spend her money on treats offered by the mimicker.

The "saving study" proceeded as follows: Participants first read an informational text on the importance of saving for the successful management of one's finances. Next, all participants were asked to commit to the goal to spend their money carefully (saving goal). Participants then received a paper-based "training" to support their intentions to save money.

In fact, they were randomly assigned either to a goal intention condition ("I want to be frugal with my money! I will keep my money for important investments!") or to an implementation intention condition ("I want to be frugal with my money! And if I am lured into buying something, then I will tell myself: I will keep my money for important investments!"). Participants were told that their saving behavior would be assessed in an online questionnaire three weeks later.

The experimenter then interviewed participants about their attitudes towards the city of Konstanz, allegedly as a part of the university's quality management program. In fact, this interview served to manipulate the mimicry factor. Adapting the classic mimicry manipulation developed by Chartrand and Bargh (1999), the experimenter either imitated participants' foot and arm postures after a slight delay during the interview (mimicry condition) or simply sat straight with her feet on the ground and her shoulders fixed (no-mimicry condition). At the end of the study, the experimenter threatened the participants' saving goal by asking them a favor: that is, to purchase chocolates or coffee vouchers with part of their compensation money from the study. The participants' purchasing behavior served as the dependent measure. When social pressure was low (no-mimicry condition), both goal intention participants and implementation intention participants managed to successfully strive for their saving goal (i.e., refused to purchase food items). However, when social pressure was high (mimicry condition), goal intention participants purchased more food items from the experimenter than the implementation intention participants did. These findings suggest that goal intentions to save money were sufficient to shield purchasing requests from a non-mimicking experimenter, but failed to be effective when a mimicking experimenter asked participants to purchase food items. Implementation intentions but not mere goal intentions were effective at shielding participants from subtle persuasive influences that acted outside of their conscious awareness.

Moderating Mimicry Effects on the Formation of Impressions

The mimicry-liking link goes both ways: Not only is a mimicking person liked more by the mimicked person, but the act of mimicking also increases positive feelings towards the mimicked person (Lakin & Chartrand, 2003). In fact, both the spontaneous mimicking (Stel & van Knippenberg, 2008) as well as the intentional mimicking (Stel & Vonk, 2009) of another person increases the mimicker's empathy towards the mimicked person. However, *a priori* dislike of the person to be mimicked has been found to be a boundary condition (Stel et al., 2010): Mimicry only increases liking when the mimicking person liked the mimicked person from the start, not when the mimicked person was *a priori* disliked. Thus, a person with a negative stereotype about a target person would not like this target more after mimicking him or her. This raises the question of how this boundary might differently affect intentional action control by goal intentions and implementation intentions. An increase in one's liking for a negatively stereotyped person after mimicking the person would indicate that the mimicker was able to avoid labeling the mimicked person as disliked from the start. Implementation intentions have been shown to successfully prevent stereotype activation and application relative to mere goal intentions (e.g., Mendoza, Gollwitzer, & Amodio, 2010). Thus, Wieber, Gollwitzer, Sheeran, and Schoch (2012) ran a further study testing whether relative to a goal intention and control instructions, an implementation intention not to stereotype would offset the inhibiting effects of disliking the target person from the start on the mimicking-liking link.

To test this hypothesis, an "online communication study" was conducted using individual participant sessions. At the beginning of each session, the participant was shown a picture (a frontal view of a young man sitting on a sofa, looking into the camera with a neutral facial expression) and a short text that suggested that the man had a domineering personality: He had worked for a hedge-fund manager for nine months, studied financial management, sold ring-tone subscriptions, and wanted to work as an investment banker in the future. Participants then rated the likeability of the young man (the target) and their desire to affiliate

with him. These ratings confirmed our pre-test findings that the person described in the text ranked low in terms of likeability. Subsequently, participants read a short paragraph on the importance of forming unbiased personal impressions. Participants were then asked to form either goal intentions ("I want to judge people realistically! I abandon all prejudice!") or implementation intentions ("I want to judge people realistically! If I am judging a person, then I will abandon all prejudice!"), or to read unrelated information about human perception (control condition).

To manipulate the mimicry factor, participants were requested either to mimic the target's posture as they watched him in a video or to remain motionless while watching the same video. The video showed the target individual sitting on a couch with his legs crossed, talking about something while gesturing and moving his feet. The video lasted about one minute and was shown without sound. The participants' ratings of the likeability of the target person after watching the video were used as the dependent variable. In the control condition, previous findings were replicated: Mimicking the disliked target person did not increase participants' liking for this person (Stel et al., 2010). More importantly, however, while mere goal intentions did not influence the inhibitory effects of *a priori* disliking, this effect was negated by the implementation intention to abandon all prejudice. Whereas goal intention participants who had mimicked the target person evaluated him as negatively as those who had not mimicked him, implementation intention participants who had mimicked the target person evaluated him as more likeable than those who had not mimicked him. The absence of the mimicry-liking effect in the goal intention condition indicates that goal intentions were not effective in preventing the influence of stereotyped impressions of the target; in contrast, the automatic effects of consciously planning to not be affected by prejudice were effective in facilitating the unconscious influence of mimicking on liking, even in the case of a previously disliked person.

Summary and Outlook

The results of the Wieber, Gollwitzer, Sheeran, and Schoch (2012) studies imply that implementation intentions are effective in helping people to retain their autonomy, as they empower individuals to reduce or to increase the impact of social influences that cannot be effectively controlled by mere goal intentions. Effortful action control by goal intentions is not sufficient to change highly automated social routines, such as reciprocating the disclosure of private information in personal interactions or helping a likeable person at the cost of one's own goals. Moreover, implementation intentions but not goal intentions helped to free people from their stereotypes and facilitated the liking of a mimicked target. In summary, action control by implementation intentions is not limited to situations of isolated individual goal striving; implementation intentions are also effective in reducing and in facilitating the social influences that others exert on individual goals. A question that remains for future research is whether implementation intentions can also improve goal striving in familiar social contexts. For instance, one might argue that it is simply too difficult to control one's responses to a social cue when the other person is a close friend (e.g., Finkel & Campbell, 2001). Still, when a friend exerts social influence, controlling one's behavior with implementation intentions might be possible nevertheless.

Intentional Action Control in Groups: Improving Group Performance

Human behavior in social contexts is not limited to individual actions, but also includes cooperative actions in social groups. Rather than striving for the individual goals of group members, groups strive for collective goals. The concept of collective goals poses a theoretical challenge: Unlike individuals, groups have no *bodily existence* beyond their members (you cannot literally touch a group). In social psychology, two broad theoretical perspectives can be distinguished that address this challenge in different ways. First, groups are perceived as real by individuals and are thus said to have a *psychological existence* (e.g., Tajfel & Turner, 1986). Second, interaction between group members allows for outcomes that might not be attributable to a single individual but only to the group as a whole, making the

group a meaningful unit of empirical analysis (e.g., Levine, Resnick, & Higgins, 1993). Thus, although one is actually shaking hands with an individual, one might experience that one is shaking hands with (the representative of) a group (e.g., Levine & Moreland, 2011; Tajfel & Turner, 1986). Collective goals can thus be defined as desired endstates that group members have agreed upon or that have been assigned to the group (e.g., Weldon & Weingart, 1993), and they can be expected to follow principles similar to those of individual goals. As with individual goals, the assumption that goal setting and goal striving are governed by different principles should also hold for collective goals. In line with this argument, motivational principles such as setting difficult, specific, and attainable goals (e.g., Kleingeld, van Mierlo, & Arends, 2011) and maintaining the certainty that the group can achieve its goal (i.e., having high collective efficacy; e.g., Bandura, 2000; Stajkovic, Lee, & Nyberg, 2009) have been shown to promote group goal achievement, similar to their counterparts in individual goal achievement. However, despite these parallels between individual and group goals, the two are not identical: Groups add complexity to the goal concept. For instance, the entire group might have a collective goal, but its individual members can also have individual goals. Thus, research on group goals must also consider the interplay between individual and group goals (e.g., De Dreu, Nijstad, & van Knippenberg, 2008).

However, as on the individual level, group members who are strongly committed to the collective goal intention might fail to translate their goal intention into goal-directed actions. In other words, collective goal striving could face a collective intention-behavior gap. Given the parallels between individual and collective goal intentions, one might assume that the collective intention-behavior gap would have characteristics similar to the individual intention-behavior gap. Facilitating group goal striving with implementation intentions should thus improve group goal achievement. However, whether concepts developed in settings of individual goal striving–such as implementation intentions–can be successfully adapted to the group level is a question that requires empirical examination. In the case of implementation

intentions, the underlying processes include the heightened activation of the situation specified in the if-part and the link between this situation and the response specified in the then-part. We must thus investigate whether these processes function in groups and address relevant problems in group goal striving (i.e., contribute to group goal achievement).

Our second line of research thus addressed whether implementation intentions also benefit striving for collective goals. In this section, we will summarize our recent studies from this line of research, which have examined representative collective goals, such as making group decisions, disengaging from collective goals that have become unattainable, and performing well on a group cooperation task.

Group Decisions in Hidden-Profile Situations

Many decisions in our lives are made by groups rather than by individuals acting alone. Examples of group decisions include investment decisions in the professional context of a company or private decisions of where to go on holiday with one's family. Groups have the potential to make better-informed decisions than individuals when the group as a whole has more relevant information than each of its members alone; that is, when individual group members have unique information relevant to the group decision (*unshared information*).

Imagine the following situation: As members of a human resources department, you and your colleagues have all read the CVs of the applicants for a position; these reveal that candidate A earned an honors degree at an elite university and candidate B earned a degree at a smaller university (shared information). However, only you know that candidate A likes to gossip about his colleagues and only another colleague knows that candidate B is highly knowledgeable about the relevant field (unshared information). Only you and your colleague can tell the others about candidate A's undesirable communication style and candidate B's expertise, thus enabling the group to optimize the selected decision alternative (i.e., to hire candidate B rather than candidate A). Because the best decision alternative (Candidate B)

cannot be identified by an individual group member acting alone, such decision contexts have been termed *hidden profiles* (Stasser, 1988).

Unfortunately, even when unshared information is brought to the table, it often has little impact on decisions in hidden-profile situations (Lu, Yuan, & McLeod, 2012). Unshared information is brought up later in discussions due to probabilistic sampling (e.g., Larson, Foster-Fishman, & Keys, 1994; Stasser, 1988), and thus the group must wait to consider it. Moreover, unshared information lacks social validation (e.g., Greitemeyer & Schulz-Hardt, 2003) and is repeated less often after it has been brought up (Stasser & Titus, 1987). Groups even seem to routinely base their decisions on pre-discussion information and preferences (e.g., Gigone & Hastie, 1993). Adequate consideration of unshared information becomes even more difficult when information load is high (Stasser & Titus, 1987). Moreover, in hidden-profile situations, suboptimal individual preferences can lead to biased information search (Schulz-Hardt, Frey, Lüthgens, & Moscovici, 2000), biased information processing (Faulmüller, Kerschreiter, Mojzisch, & Schulz-Hardt, 2010), or even strategic information sharing influenced by individual decision preferences (e.g., concealing information; Steinel, Utz, & Koning, 2010). All of these factors can lead groups to make suboptimal decisions in hidden-profile situations.

Although the processes underlying group difficulties in solving hidden profiles are well-known, research has focused less on the reasons why groups fail to counteract these biases: In many studies, groups are openly instructed that unshared information might exist and that all information will be necessary to identify the best alternative (e.g., Greitemeyer, Schulz-Hardt, Brodbeck, & Frey, 2006) or even receive monetary incentives for finding the best decision alternative (e.g., Greitemeyer et al., 2006). Therefore, participants should be highly motivated to make a good decision and know the behaviors that lead to good decisions. At first, it thus seems counterintuitive that groups still fail to solve hidden profiles.

However, from an action perspective, this failure does not come as a surprise: Many of the aforementioned challenges in considering unshared information (e.g., breaking a routine, dealing with cognitive load, and seizing a specific opportunity) can hinder goal striving. The finding that groups do not achieve their goal to make an informed decision when unshared information is crucial (i.e., in hidden-profile situations) is in perfect accordance with the action approach. Implementation intentions have been shown to help moderate these challenges (see the introduction to this contribution; Gollwitzer & Sheeran, 2006), and so we investigated whether groups would be able to improve their decision making by forming implementation intentions.

Thürmer, Wieber, and Gollwitzer (2012) tested this hypothesis in two studies. In the first study, participants worked on hidden-profile cases (adapted from Greitemeyer et al., 2006) in which the best alternative was not obvious to individual group members but could be identified on the basis of the group's total information. Before commencing the consideration of decision cases, participants first set the goal to find the best decision alternative; participants in half of the groups furnished this goal with the implementation intention "When we are about to make the final decision, then we will go over the advantages of the non-preferred alternatives again." Three hidden-profile decision cases followed (e.g., choosing a flat). In each case, each participant received individual information on the three alternatives (e.g., flat A is spacious, has a balcony, is in the industrial area, etc.) All group participants then gathered to discuss the case and come to a final decision. The measure of interest here was whether groups would choose the best alternative. In line with our prediction, the groups who had complemented their goal intention with an implementation intention chose the best alternative more often than groups who had not. Moreover, analysis of the audio recordings of group discussions revealed that implementation intention groups indeed repeated more positive information items before the decision. A second study replicated this result in a setting that allowed greater experimental control over the information discussed. As in the

first hidden-profile group study, participants completed the decision training (goal intention vs. implementation intention) and studied their initial information. However, instead of participating in an actual group discussion, participants watched a fictitious computer-animated discussion. A graphic depicted the participant and the other two group members. After a few seconds, a speech bubble appeared over one of the group members, relating an information item in everyday language. Once participants had read the screen, they went on to the next. In this way, each participant was exposed to all of the information during this computer-animated group discussion. Finally, the participants made their decision as representatives of the computerized group. The results again showed that participants who had furnished their goal with an implementation intention solved the hidden profile more often than control participants.

Repeated Group Decisions and the Escalation of Commitment

While the primary challenge for groups in hidden-profile situations is to consider all information, the challenge for groups in repeated decision making is to consider only information about the present and the future but not information about the past, as past investments may bias rational decision making. Investments (e.g., time, money, or willpower) are warranted when one will be able to overcome future obstacles on the way to group goal attainment (e.g., project realization). However, if the obstacles are likely to become too costly or even impossible to surmount, investments should be reduced, since the likelihood that the project can be successfully completed is low and there is an increasing risk that follow-up investments will be in vain. In other words, commitment to the goal should be reduced or even terminated.

However, research has shown that groups tend to stick to their guns and to remain committed despite negative outcomes (e.g., Dietz-Uhler, 1996; Haslam et al., 2006). This *escalation of commitment* seems to be grounded in the need to justify past decisions: When groups decide whether to continue a project, escalation of commitment has been observed

when the participants were responsible for the initial decision on the project, but occurs to a lesser degree when others were responsible for the initial decision (Bobocel & Meyer, 1994; Staw, 1976). Thus, when control over subsequent decisions can be delegated to external decision makers who were not responsible for the initial decision (Simonson & Staw, 1992) or to decision makers who can use other means of self-justification, escalation is less likely to occur (Sivanathan, Molden, Galinsky, & Ku, 2008). Moreover, low identification (in comparison to high identification) with the group reduces escalation (Haslam et al., 2006). If membership in the group is not very important to the group members, escalation is less likely. This is unfortunate, as highly identified and responsible group members care deeply about the group's welfare and performance. Decreasing actual responsibility and identification is thus not a viable option. However, these findings also imply that groups could improve their decisions by adopting the perspective of a group that is not responsible for previous decisions. Judging the situation from the perspective of an outsider could encourage group members to make decisions based on the future rather than the past, thereby decreasing the escalation of commitment.

However, adopting such a perspective requires effort (Vorauer, Martens, & Sasaki, 2009) and thus might be difficult to accomplish in group contexts: Even when group members are motivated to use this perspective-changing strategy, they might forget to apply it when the time comes to make the actual group decision. Implementation intentions should facilitate the application of this strategy because they automate the detection of the specified situation and the action initiation, and do not require effortful deliberation. The appropriate situation in which to apply the perspective-changing strategy would be when the group is about to make its decision. At this point, it is crucial that the group weighs the pros and cons of the collective goal based on the present state of affairs, without trying to justify past investments. The situation-response link created by implementation intentions should ensure that the selected

behavioral strategy (using an onlooker's perspective) is indeed initiated during the group interaction.

In their study, Wieber, Thürmer, and Gollwitzer (2012) adapted a well-established paradigm (Haslam et al., 2006) to test this prediction. Participants assumed the role of a city's social council in deciding how much to invest in an ongoing kindergarten project. At the onset of the experiment, participants in groups of three formed a collective goal intention and furnished it with either an additional collective goal strategy ("We want to judge the project as onlookers who are not responsible for earlier investment decisions!") or a collective implementation intention ("When we are about to make an investment decision, then we will judge the project as onlookers who are not responsible for earlier decisions!"). The actual project evolved over three consecutive phases, each consisting of an information package about the project's progress, a group discussion on the basis of this information, and a collective decision of how much to invest. While the successful start of the project in Phase 1 made high levels of investment advisable, the following Phases 2 and 3 were less successful and called for reduced investment (i.e., reduced commitment). The dependent variable of interest was the group's investment per phase. In line with the predictions, the two conditions did not differ in their investments in Phase 1. However, while goal strategies led to similarly high levels of investment in Phases 2 and 3, implementation intentions reduced groups' investment levels in keeping with the project's poor prospects. Thus, the helpful strategy of judging the project as an onlooker was applied more successfully when it was included in an implementation intention. While this escalation study demonstrates that the challenge that implementation intentions help groups to master the challenge of collectively reducing commitment in response to negative conditions, it remains unclear whether implementation intentions can also improve the coordination of group action.

Promoting Cooperation in School Children

One central challenge that groups face is the effective coordination of individual actions when group members cooperate in order to attain a collective goal. To test whether implementation intentions can promote cooperation in groups, Wieber, Gollwitzer, Fäsche, and colleagues (2012) tested fourth-grade children's cooperative behavior in a school setting. Groups of four children performed a cooperative puzzle task: A puzzle was divided into four quadrants, one for each child. Each quadrant depicted a small butterfly (individual part) and a part of a large brown butterfly which spanned all four quadrants (cooperative part). Each child received a number of puzzle pieces, some belonging to the individual part and some belonging to the cooperative part. The individual part pieces each child received to start with always belonged to the child's quadrant. The cooperative pieces, however, always belonged to another child's quadrant. According to the task rules, each child was only allowed to put down puzzle pieces on his or her quadrant of the puzzle but not in anybody else's quadrant. Completing the cooperative part thus required cooperation as the children had to exchange the pieces belonging to the brown butterfly before they could be added to the puzzle. All groups were provided a strategy for increasing their group score: They learned that cooperative pieces should be given to the other group members, and that fitting these pieces was awarded with more points than fitting the individual pieces (two points rather than one point). All of the children then formed the goal "I want to score as many points with my group as possible!"; however, only half of the groups added the implementation intention "And if I see a part of the brown butterfly, then I will give it to the appropriate child immediately!" Groups who had furnished their goal to perform well with an implementation intention scored higher overall, especially when only the cooperative points were counted. In other words, forming an implementation intention supported collective goal achievement by increasing the cooperative behavior of group members.

Summary and Outlook

The reported four studies show that implementation intentions improve collective goal striving, as indicated by improved group performance. Groups who furnished their goal intentions to make informed decisions with implementation intentions considered relevant information more effectively and made better decisions in hidden-profile situations (Thürmer et al., 2012). In addition, groups who furnished their goal intentions to make impartial investment decisions with implementation intentions managed to avoid inappropriate escalation of their commitment and to make decisions based on the present and future rather than the past, as indicated by reduced investments in response to project failure (Wieber, Thürmer, et al., 2012). Further evidence of the effectiveness of implementation intentions in improving action control in collective goal striving was found in the domain of cooperation (Wieber, Gollwitzer, Fäsche, et al., 2012). Furnishing the goal intention to get a high score in a cooperative puzzle task with an implementation intention helped school children to work cooperatively with other group members and to score more points. In view of the fact that the children's task was highly engaging and was performed under time pressure, the results are in line with the assumption that the effects of implementation intentions on collective goal striving carry features of automaticity. Overall, these studies demonstrate that intentional action control by implementation intentions is possible in groups and can benefit group performance. Thus, collective goal striving as well as individual goal striving can profit from if-then planning.

From these promising findings, questions concerning the potential complexity of collective goal striving with implementation intentions arise. Group theory and research on groups suggest that groups have two modes of self-regulation available (e.g., Jonas, Sassenberg, & Scheepers, 2010; Levine, Alexander, & Hansen, 2010): each group member self-regulating individually, or regulating collectively as a group. In terms of implementation intention theory, this suggests that if-then plans could either address the individual (I) or the

group (we). Addressing the group instead of the individual as the actor in an implementation intention (i.e., in the then-part) might reduce its effectiveness. For instance, the strategic automation of goal striving might not function as swiftly, as the wording of the intention does not specify which group member must act. While two studies presented here (Thürmer et al, 2012; Wieber, Thürmer, & Gollwitzer, 2012) applied such we-implementation intentions successfully, it is unclear whether implementation intentions targeting the individual would have been more effective. Future research should thus systematically investigate the role of these two modes of self-regulation by implementation intentions.

Conclusion

We have discussed two types of intentional action control in individuals and groups: action control by goal intentions and by additional implementation intentions that specify when, where, and how to act. While goal intentions alone do not always ensure goal achievement, implementation intentions help to overcome the gap between individual as well as group intentions and actions. Throughout the research discussed, individuals and groups translated their goals into actions more successfully when they added implementation intentions to their goal intentions. Despite subtle antagonistic social influences, individuals managed to stick to their goal to reduce the disclosure of personal information and to their goal to save money (Wieber, Gollwitzer, Sheeran, et al., 2012). Moreover, implementation intentions were effective in facilitating subtle social influences, overcoming known limitations of the mimicry-liking effect (Wieber, Gollwitzer, Sheeran, et al., 2012). Groups with respective implementation intentions were found to make better-informed decisions in hidden-profile situations (Thürmer et al., 2012), demonstrated less escalation of commitment when projects became likely to fail (Wieber, Thürmer, et al., 2012), and cooperated more successfully during collective goal striving in a school setting (Wieber, Gollwitzer, Fäsche, et al., 2012).

Although implementation intentions have been shown to consistently improve action control relative to goal intentions, the limits of this if-then planning strategy become obvious when one looks at the absolute change in behavior. In interpersonal social situations, even when implementation intentions were in use, participants disclosed some personal information and some participants failed to act on their saving goal or their goal to avoid the influence of prejudice. In group situations, even with implementation intentions, groups did not manage to solve all the hidden profiles, groups still invested some money in failing projects, and group members still engaged in uncooperative behaviors to some extent. However, given the difficulty of completely turning around both individual and group behavior in these contexts (as established by previous research), implementation intentions are an easily applicable and effective strategy to extend the limits of intentional action control.

Moreover, the effectiveness of implementation intentions depends on the strategies included within them. Forming an if-then plan facilitates the initiation of response (y) in a given situation (x), but this situation and response must be suitable for goal striving. In other words, performing (y) in situation (x) must effectively reduce the discrepancy between the current state and the desired endstate. In order to identify appropriate situation-response combinations, we must rely on evidence provided by studies from related fields. Concepts and empirical findings from disciplines such as cognitive psychology (e.g., executive functions; see Grzyb, this volume), developmental psychology (e.g., cooperation; see Heikamp, Trommsdorff, & Fäsche, this volume), law (e.g., the distinction between different kinds of norms; see Roehl, this volume), and philosophy (alternative perspectives on consciousness; see Schmitz, this volume) have inspired the research presented in this article. For instance, our colleagues in developmental psychology have pointed to the importance of children's development of intentionality for successful cooperation with their peers (see Heikamp, Tromsdorff, & Fäsche, this volume; see also McIntyre, Blacher, & Baker, 2006). We therefore jointly investigated whether our psychology of action approach could help children

to cooperate successfully (Wieber, Gollwitzer, Fäsche, et al., 2012). In view of the fact that implementation intentions have indeed been shown to improve action control in social contexts and in groups, we hope that the effects we have described in this article and their underlying processes will create reciprocal inspiration for other researchers, irrespective of discipline.

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