

Open questions in implementation intention research

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WEBB (THIS VOLUME) CONSIDERS the making of if-then plans (i.e. implementation intentions such as 'If the waiter asks me for my order, then I will choose a vegetarian dish and a non-alcoholic drink!') as a powerful self-regulation strategy that helps people to meet their goals of doing more good and less bad. He points to the comparative lack of success that is achieved when people restrict their self-regulation to the forming of mere goals (e.g. 'I want to eat more vegetables!' and 'I want to drink less alcohol!'). This common goal intention-behaviour gap is due to the fact that people often do not have access to the necessary skills, efforts, and opportunities, and that they often face conflicting behavioural tendencies exactly at that point in time when it were appropriate to act on the focal goal – no matter whether these opposing forces originate from inside or outside, from chronic bad habits or pressing competing goals.

Webb argues that explicating the implementation of one's goals should facilitate their attainment, in particular if this is done in the form of if-then plans (implementation intentions). This should be the case because of the following psychological mechanisms (Gollwitzer, 1993, 1999): the mental representation of the critical situational cues specified in the if-part of an implementation intention becomes highly activated and thus these cues are more easily recalled and detected, as well as more readily attended to. Moreover, in the presence of the critical cue, the initiation of the goal-directed response specified in the then-part becomes automated in the sense that it is now immediate, efficient (i.e. effortless), and no longer requires a conscious intent. In support of

these ideas, Webb reports studies showing that goal attainment is generally facilitated when implementation intentions have been formed, and that implementation intention effects are particularly pronounced when goal attainment is difficult by itself or becomes difficult because of the interference of bad habits. He then describes experiments that allow attributing these beneficial effects to the postulated mechanisms (e.g. Aarts *et al.*, 1999, for the heightened activation of the mental representation of specified cues; and Webb and Sheeran, under review, for the automation of the specified goal-directed response).

Finally, Webb raises some open issues of implementation intention research. He asks intriguing questions of: (a) how the motivation to reach a given goal influences the effects of respective implementation intentions on actual goal attainment; (b) whether the formation of multiple if-then plans in the service of a given goal weakens implementation intention effects; and (c) whether there are individual difference variables that potentially modify implementation intention effects. In the following I will address these issues one by one.

The goal intention (motivation) and implementation intention (volition) interplay

The interplay of goal intentions and implementation intentions may be discussed from a couple of different perspectives. For instance, one might wonder whether the formation of an implementation intention may actually act back on the goal intention by inducing an increased goal strength (I want to reach a particularly high standard!) as well as an enhanced private

(I really want to reach my goal!) or public (I feel obligated to reach my goal!) goal commitment. So far, research suggests (meta-analysis by Gollwitzer & Sheeran, in press) that the formation of implementation intentions leaves goal strength and private/public goal commitment unaffected. Still, research on the postulated psychological mechanisms of implementation intention effects (i.e. heightened activation of the specified situational cue, automation of the initiation of the goal-directed response) should make it a habit to assess potential changes in goal strength and private/public goal commitment, thus being in a good position to rule out potential alternative explanations in terms of heightened goal strength and private/public goal commitment.

Another interplay question refers to whether implementation intentions are responsive to the activation of the super-ordinate goal intention. If implementation intentions affect a person's behaviour regardless of the activation of the superordinate goal, the likelihood that people misbehave in the sense of showing the intended goal-directed behaviour at times and situations where the respective goal pursuit is uncalled for. If this were the case, the goal attainment benefits of forming implementation intentions would have to be paid for by a lack of sensitivity with respect to when and where it is appropriate to act on one's goals. However, Webb (2003; see also Sheeran *et al.*, 2005, Study 2) found that implementation intention effects are sensitive to the (even subliminal) activation of the super-ordinate goal (i.e. implementation intentions only affect behaviour when the super-ordinate goal is activated), and thus worries of such a cost of implementation intention formation seem unfounded.

But implementation intention effects are not only sensitive to goal activation, they also respect the strength of the super-ordinate goal as observed by Sheeran *et al.* (2005, Study 1). The more hours college students wanted to engage in independent study, the

greater the beneficial effects of respective implementation intentions specifying when, where, and how to study. This finding suggests that implementation intention effects should also be responsive to the degree of private/public commitment with which a person holds a certain goal (see Orbell *et al.*, 1997). Such responsiveness is reassuring as it guarantees that people do not invest in goals that are of weak goal strength or low commitment simply because they have formed if-then plans. On the other hand, if implementation intentions fail to benefit goal attainment given that the goal is weak or of low commitment, applied psychologists who want to use implementation intentions in interventions geared at helping people with goal attainment face a problem: They first have to ensure that goal strength and goal commitment are high before suggesting the formation of if-then plans. Based on the theory of mental contrasting (Oettingen, 2000; Oettingen *et al.*, 2001), we (Stadler *et al.*, 2005) have recently developed a two-step intervention procedure following this line of thought. In the first step, strong commitments to high goals are established by requesting people to envision the desired events as positively as possible and then contrast them with the obstacles of present reality that impede realising these imagined events. In a second step, people are asked to specify these obstacles in the if-part of implementation intentions and then link them to suitable goal-directed behaviours in the then-part. When we applied this intervention to 30- to 50-year-old women to better their diet and exercise behaviour, we observed that the intervention group improved their food intake and exercise behaviour as compared to a control group that was merely given information on how to achieve the goals of eating healthier and exercise more. Improvements started as soon as a week after the intervention and were maintained over four months.

A final interplay issue is the following: Given the fact that the beneficial effects of

if-then planning unfold only when people entertain strong commitments to challenging goals (i.e. possess high motivation), it becomes important that people keep up high motivation throughout goal striving. Strong motivation is dependent not only on high perceived desirability but also on high perceived feasibility of the wanted future event. Accordingly, people have to retain high self-efficacy beliefs throughout the process of goal striving, if they want to profit from their if-then plans. But how do people keep up such self-confidence? We (Bayer & Gollwitzer, under review) have recently explored whether implementation intentions can be used to serve this motivational purpose. We asked college students to solve a series of Raven Matrices that became increasingly more difficult. We established a mere goal intention group (i.e. I want to correctly solve a very high number of matrices!) and an implementation intention group (i.e. And as soon as I start working on a new matrix, I'll tell myself that I can do it). As it turned out, the implementation intention group outperformed the mere goal intention group suggesting that implementation intentions allow for effective motivation control by linking self-assuring statements to distinct critical cues.

Single plans or multiple plans

Given the beneficial effects of if-then planning on goal attainment, one wonders how many individual if-then plans people should form for any given goal. If the goal at hand can be served in many different situations and various ways (e.g. the goal to do more physical exercise), it seems wise to specify multiple plans that make use of the many suitable opportunities and instrumental goal-directed responses available. Still, there is the question of whether it is better to solely focus on one particular situation and make several plans that link this very situation to various different instrumental goal-directed behaviours, or to focus on just one particular goal-directed behaviour and make plans that link it to the various available suitable situa-

tions. Or should people go ahead and first list various highly suitable situations and then link each of them to a unique, most fitting goal-directed behaviour? Alternatively, people might first list various instrumental goal-directed behaviours and then select most appropriate situations for each of these behaviours.

Answers to these questions need to consider the moderators of implementation intention effects as well as the mechanisms on which they are based. Next to high goal strength and goal commitment, a further important moderator is a person's commitment to the formed plan (Gollwitzer & Sheeran, in press). Only if a person strongly commits to a formed if-then plan are we to expect beneficial effects on goal attainment. Intuitively it seems easier to commit to plans that specify either one critical situation only (that is then linked to a multitude of goal-directed behaviours) or just one critical goal-directed behaviour (that is then linked to a multitude of suitable situations) than to a multitude of if-then links between critical situations and behaviours. But it is up for empirical research to find decisive answers to this question.

If one considers the mechanisms on which imps are based, one has to distinguish between the mechanisms that relate to the if-part (i.e. identification processes) versus the mechanisms that relate to the then-part of implementation intentions (i.e. response initiation processes). The postulated heightened activation of the cues specified in the if-part of implementation intentions implies that if-then planning which focuses on one specific cue only that is then linked to multiple goal-directed behaviours is to be preferred over the forming of plans each using a different situational cue (principle of cue competition). The postulated automated initiation of the response specified in the then-part of implementation intentions suggests that the formation of plans that link just one goal-directed behaviour to a select situational cue should facilitate automation of action initiation and should thus be

preferred in comparison to making if-then plans that link various different goal-directed behaviours to one and the same situational cue (principle of response competition).

Individual differences

The role of individual differences can also be discussed from various different perspectives. First, there is the straightforward applied question of which people should not bother to make plans, as implementation intentions will fail to have beneficial effects for them. This question should be answered by taking into consideration that implementation intention effects know certain moderators but are based on very simple psychological mechanisms. With respect to moderation we know that high goal strength and goal commitment are a prerequisite (see above), and thus, to give an example, one cannot expect people with strong power and low affiliation motives to benefit from implementation intention formation when trying to meet goals geared at socialising with others. Moreover, as a person's commitment to an if-then plan formed also moderates goal attainment effects (see Gollwitzer & Sheeran, in press), certain groups of people may not benefit from forming implementation intentions because they find it aversive to plan out goal striving in advance and thus do not commit to if-then plans (e.g. for individuals high on socially prescribed perfectionism if-then planning was found to arouse negative affect; Powers *et al.*, 2005).

When one considers the psychological mechanisms on which implementation intention effects are based, it is hard to conceive of a group of individuals who cannot take advantage of these simple mechanisms (i.e. facilitated cue identification and automated action initiation). As long as people succeed in specifying suitable cues (i.e. cues that actually arise) in the if-part of their implementation intentions, and then link them to instrumental goal-directed responses in the then-part that can actually be preformed in the presence of these cues,

if-then plans should achieve their beneficial effects. Some groups of individuals may need help with this task (e.g. highly depressed individuals), but once if-then plans with appropriate if- and then-parts are in place they should succeed in facilitating goal attainment. Indeed, even individuals with chronic problems in action control (e.g. frontal lobe patients, Lengfelder & Gollwitzer, 2001; schizophrenics and heroin addicts under withdrawal, Brandstätter *et al.*, 2001; ADHD children, Gawrilow & Gollwitzer, submitted) showed an increased rate of goal attainment when if-then plans were assigned to them by the experimenter.

Still, there is the issue of whether there are certain individuals who are particularly skilled in forming if-then plans. We have recently started to analyse this question by developing a computer task that allows determining how good a person is in creating strong mental links between anticipated critical cues and goal-directed responses (Grant *et al.*, submitted). If one conceives of personality in terms of 'intra-individually stable, if...then..., situation-behaviour relations' (Mischel & Shoda, 1995, p.248), the question of skilful if-then plan formation also refers to the types of situations and responses that are linked. Let us assume that a person has the goal to reduce aggression in relating to others, and he also knows about his respective situation-behaviour profile (i.e. he knows what kind of social situations elicit aggressive responses in him and how staying calm and collected is possible in other social situations). Given this goal and knowledge, the person can now tailor his implementation intentions to those critical, anger-eliciting situations specifying responses that allow him to stay calm. Thus, it seems likely that people differ not only in terms of the strength of the if-then links they are able to create but also in terms of coming up with if-parts and then-parts that take into account their unique chronic situation-behaviour profiles, specifying implementation intentions exactly where and how they are needed.

Conclusion

Even though the distinction between goal intentions and implementation intentions has spurred an enormous amount of empirical research (Gollwitzer & Sheeran, in press), there are still a number of theoretical issues that await clarification. Three of these have been addressed here: the interplay of goal and implementation intentions, the forming of multiple implementation intentions, and the issue of inter-individual differences. Further promising questions to be addressed in the future are: what are the situational determinants of spontaneous imple-

mentation formation, what kinds of 'if' and 'then' specifications achieve the most tenacity in goal striving without curbing flexibility, and finally, what are the neural substrates of action control by implementation intentions.

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