

6 Changing Behavior Using the Model of Action Phases

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Practical Summary

The model of action phases highlights the distinction between the “why” and “how” questions related to goal pursuit. It implies that changing the behavior of individuals who have not yet decided to pursue a goal needs a “why”-oriented approach focusing on motivation, reasons, and rationale, whereas changing the behavior of people who have decided to pursue a goal needs a “how”-oriented approach focusing on strategies needed to enact the behaviors to attain the goal. The mindset theory of action phases proposes that different mental procedures need to be activated before a decision to perform a behavior to obtain a distal goal has been made compared to the procedures needed for goal pursuit after a decision has been made. These distinct *deliberative* and *implemental* mindsets influence the effectiveness of interventions geared at behavior change. Furthermore, implementation intentions (i.e., plans that specify in advance how the person will strive for chosen goals) are a particularly useful implemental tool and have been found to facilitate goal attainment.

6.1 Introduction

In the mid-1980s, Heckhausen and Gollwitzer set out to analyze how people control their actions (see Heckhausen, Gollwitzer, & Weinert, 1987). They quickly realized that breaking action control down into different phases greatly benefited its understanding. Heckhausen and Gollwitzer’s analysis was heavily influenced by the work of Kurt Lewin (e.g., Lewin et al., 1944), for whom there was never any doubt that motivational phenomena can only be properly understood and analyzed from an action perspective that distinguishes the processes of goal setting from those of goal striving, an insight that went unheeded for several decades. Accordingly, Heckhausen and Gollwitzer (1987) proposed the “Rubicon” model of action phases, which describes the course of action as a temporal, linear path

starting with a person’s wishes or desires and ending with the evaluation of the action outcomes achieved. The model was designed to raise and help answer the following questions: How do people select their goals? How do they plan the execution of goal striving? How do they enact these plans? Moreover, how do they evaluate their accomplishments? According to the Rubicon model, a course of action involves a phase of deliberating the desirability and feasibility of one’s wishes at the outset in order to arrive at a binding decision regarding which of them one wants to pursue as a goal (pre-decisional phase), a phase of planning concrete strategies for achieving this goal

Lucas Keller and Peter M. Gollwitzer gratefully acknowledge support from the German Research Foundation (DFG; FOR 2374).

<https://doi.org/10.1017/97811086773180.006>

(the pre-actional phase), a phase of enacting these plans (actional phase), and finally a phase of evaluating the achieved outcomes (post-actional phase).

The Rubicon model was subsequently superseded by the mindset theory of action phases, in which each of the four phases was proposed to be associated with a distinct mindset (Gollwitzer, 1990, 2012). Defining the mindset in each phase required specifying in detail what kinds of phase-specific tasks need to be solved and whether engagement with these tasks initiates a distinct mindset that facilitates task performance. Research on mindset theory of action phases targeted the pre-decisional phase and the pre-actional phase and thus analyzed the features of the deliberative and implemental mindsets, respectively (for an interesting assessment of mindsets in the post-actional phase, see McCrea & Vann, 2018). For instance, with respect to the pre-actional phase, it was postulated that the individual's task is to prepare to "strive" for the upcoming goal. In line with this task demand, it was hypothesized and found in extensive experimental research (e.g., Heckhausen & Gollwitzer, 1987) using cognitive paradigms that the pre-actional individual is indeed focused on planning out the upcoming goal striving prospectively and that the respective implemental mindset carries cognitive features that facilitate meeting this task demand. Subsequent research (Gollwitzer, 1999, 2014) going beyond the implemental mindset notion started to explore what kind of planning is particularly effective in helping people to realize their goals. This research revealed that implementation intentions, specific cue-contingent plans linking context and action, qualify as a powerful self-regulation tool when it comes to striving for one's goals, no matter to which domain these goals pertain (e.g., health, achievement, interpersonal; Gollwitzer & Sheeran, 2006).

Research on mindset theory of action phases and implementation intentions are both inspired by the science of motivation. However, this research does not limit itself to expectancy-value type theorizing (see also Chapter 2, this volume). Rather, concepts

used by theorists in the early days of motivation science such as Narziss Ach, William James, and Kurt Lewin (see summary by Gollwitzer, 2018), including goals, plans, and mindsets, were revived to better understand what determines people's actions and, in particular, how to change established action patterns. Moreover, this research also restored the distinction between motivation and volition by differentiating motivational phases of action that are occupied with the why of pursuing a certain goal and whether goal attainment did actually satisfy the person's needs versus volitional phases that are occupied with planning out the how of striving for a chosen goal and getting involved with effectively realizing one's goal commitments.

The purpose of this chapter is to lay out the basic tenets and characteristics of mindset theory of action phases and implementation intention theory. Furthermore, it will provide an overview of how to induce respective mindsets and how planning with implementation intentions can help people attain their goals. The chapter is thus structured as follows: First, the mindset theory of action phases is presented in Section 6.2.1 alongside results of experimental research highlighting the differences in information processing in the different phases of the model. Next, the behavior change strategy of implementation intentions is outlined in Section 6.2.2 and the psychological processes by which implementation intentions affect behavior change described. Section 6.3 addresses the question of how the notion of mindsets (Section 6.3.1) and implementation intentions (Section 6.3.2) can be applied to understand and instigate behavior change. In Section 6.4, a meta-analysis of meta-analyses is presented that assesses the effectiveness of implementation intentions to instigate behavior change across a wide range of different domains and samples. Finally, Section 6.5 presents an outlook on potential future studies applying both mindsets and implementation intentions to instigate behavior change and fill gaps in the knowledge base regarding the underlying processes.

6.2 Brief Overview of the Theory and Evidence

6.2.1 Mindset Theory of Action Phases

Mindset theory of action phases describes successful goal pursuit as the smooth transition through the four consecutive but distinct action phases postulated in the Rubicon model (see Figure 6.1). In the first action phase, individuals have not yet decided what to do and must weigh the pros and cons and feasibility of their wishes. Once a wish has been turned into a binding goal that one wants to realize (i.e., the proverbial “Rubicon” has been crossed), the process enters the second action phase in which individuals plan the implementation of their decision. In the third action phase, individuals act on their goal by initiating goal striving and overcoming obstacles to stay on track. In the fourth and final action phase, after having completed their goal striving, individuals evaluate their progress, deeming further goal-directed action to be either necessary or futile. In each of these phases, individuals face different task demands that activate a typical set of beneficial cognitive procedures – termed “mindsets.” Once activated, these mindsets can carry over to

unrelated tasks – tasks that are different to those used to instigate the mindsets in the first place. This feature of action-phase-related mindsets allows for testing the presumed distinct task demands of the four action phases and answering the question of whether the four action phases of the Rubicon model are indeed distinct. Moreover, because of their trans-situational stability, inducing action-phase-related mindsets can be used to instigate behavior change (for overviews, see Gollwitzer, 2012; Gollwitzer & Keller, 2016).

Making a goal decision has striking consequences for both information search and information processing. Before a decision to strive for a given goal is made, individuals need to process all available information in a relatively accurate manner with regard to both the feasibility (i.e., realistic assessments; e.g., Puca, 2001) and the desirability (i.e., impartial assessments; e.g., Taylor & Gollwitzer, 1995) of striving for this goal. Therefore, a certain open-mindedness concerning available information is beneficial in this early phase as well as accurate processing of this information (e.g., Fujita, Gollwitzer, & Oettingen, 2007). Once a decision has been made and the metaphorical Rubicon has been crossed, however, information on desirability and feasibility that may

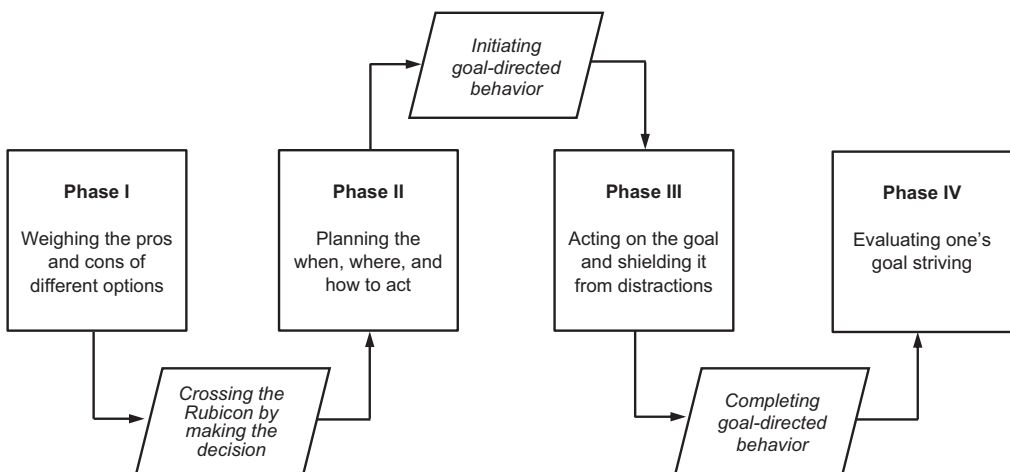


Figure 6.1 The model of action phases

threaten the basis of the initial decision has to be disregarded (e.g., Bayer & Gollwitzer, 2005); now one needs to become more closed-minded in processing potentially relevant information. The task is to get started on striving for the chosen goal and, once started, one needs to stay on track; accordingly, shielding one's goal striving from potential interferences is called for. The optimal focus on the implementation of the goal involves planning out when, where, and how to act; doing so activates a strong implemental mindset with cognitive features that help to meet the task demands of the pre-actional phase. Research on the features of the implemental mindset has in turn sparked interest in finding out what are particularly effective plans in facilitating goal striving and thus enhancing goal attainment (i.e., so-called implementation intentions).

6.2.2 Implementation Intentions

Implementation intentions (see Gollwitzer, 1993, 1999, 2014) are plans that specify when, where, and how one will initiate a goal-directed response and involve creating an *if* (critical situation) and *then* (goal-directed response) contingency. Both the critical situation (opportunity or obstacle) and the goal-directed responses can take on quite different forms. For instance, the critical situation can be either inside (e.g., a certain feeling) or outside (e.g., a certain point in time or a certain event) the person, and the goal-directed response can pertain not only initiating or inhibiting a simple behavior (e.g., eating an apple, ignoring snacks) but also to thinking about things in a certain way (e.g., a positive evaluation) as well as engaging in or regulating a feeling (e.g., feeling pride, ignoring one's negative mood). The effects of implementation intentions rest on two key processes: (1) they enhance the perception of, and attention to, the specified critical situation, and (2) they allow for automatic initiation of the specified goal-directed response on encountering the critical situation. Individuals who have

formed an implementation intention that specifies a critical situation in which a planned response is to be enacted are faster and more efficient in detecting this situation and in enacting the respective goal-directed response (e.g., Brandstätter, Lengfelder, & Gollwitzer, 2001; Orbell & Sheeran, 2000) – and this all without the need for further conscious involvement (e.g., self-talk such as “Oh, the critical situation is here; I'd better get going now!”; e.g., Bayer et al., 2009). Forming implementation intentions switches a person's action control by goals (i.e., effortful, top-down control) to action control by specified critical situations (i.e., automatic, bottom-up control).

6.3 How Does Research Stimulated by Mindset Theory of Action Phases Inform Changing Behavior?

6.3.1 Deliberative and Implemental Mindsets

People with a deliberative mindset have been found to become more open-minded with respect to processing available information, more impartial in evaluating pros and cons, and more realistic in judging probabilities of success than people with an implemental mindset. Examples of how to induce deliberative and implemental mindsets are provided in Sidebar 6.1. There is also evidence that these distinct cognitive orientations have different downstream consequences in terms of actual goal striving. For example, individuals with an implemental mindset evinced comparatively higher persistence in the face of difficulties and were more eager to work on their goals as expressed in less time needed for task completion than those in a deliberative mindset (Brandstätter et al., 2015).

More recent mindset research showed that participants in an implemental mindset not only exhibit relative closed-mindedness with respect to processing available information but also show a more

Sidebar 6.1 How to induce deliberative and implemental mindsets

Mindset inductions are key tools in empirical research on mindset theory of action phases. In a typical deliberative mindset induction, participants are asked to think about an unresolved personal concern (e.g., “Should I stop smoking?”; “Shall I move to a less noisy part of the city?”) that is currently on their mind but they have not yet decided on whether to act or not. Participants then go on to list short- and long-term, positive and negative consequences of both making a change decision and not making a change decision (i.e., maintaining the status quo). These personal wishes are commonly self-chosen by participants and often bear little resemblance to the behavior that is supposed to be changed.

In a typical implemental mindset induction, participants are asked to think about a current personal project that they have decided to realize but have not acted on yet (e.g., “I want to drink less alcohol!”; “I want to exercise at least once a week!”). They are then asked to list a series of steps necessary to implement this project and to write down when, where, and how they plan to enact each of these envisioned steps. Again, these unresolved projects are self-chosen and often do not share any overlap with the behavior that is targeted for change.

Experimental research on action phase mindsets (see an overview by Gollwitzer, 2012) has demonstrated that the more the unresolved concerns or chosen projects are of personal importance, the stronger the respective mindset effects (Taylor & Gollwitzer, 1995). Thus, to allow individuals enough time to really ponder their concerns or projects, the mindset inductions should take around fifteen minutes. Inductions can be paper- or computer-based as long as people are guided by precise instructions.

focused, narrower breadth of visual attention (determined by tracking eye movements) compared to participants in a deliberative mindset (Büttner et al., 2014). In line with implemental mindset effects on illusory feelings of control, Hügelschäfer and Achtziger (2014) found that participants in an implemental mindset are also more confident in having correctly answered questions in a general knowledge test than participants in a deliberative mindset. Strikingly, Dennehy, Ben-Zeev, and Tanigawa (2014) found that an implemental mindset helps people to shield themselves from the detrimental effects of stereotype threat. The induction of an implemental mindset helped participants from a low socioeconomic status background to overcome performance anxiety in a speeded mental arithmetic task, thus attenuating performance deficits caused by the experience of stereotype threat.

Recent research also tested whether deliberative versus implemental mindsets influence risk-taking behavior (Keller & Gollwitzer, 2017) using the Balloon Analogue Risk Task (BART; Lejuez et al., 2002). In the BART, one has to decide after each pump whether to go on pumping a balloon one more time or to save its current value and opt out. Each pump increases the balloon’s current value but also risks the balloon popping and the loss of the entire current value of the balloon. The BART mirrors risk-taking in the real world quite well (i.e., has a high ecological validity) as, for instance, indicated by the fact that it can differentiate smokers from nonsmokers (Lejuez, Aklin, Jones et al., 2003) and correlates with a variety of real-world risk-taking behaviors in adolescents (Lejuez, Aklin, Zvolensky et al., 2003). Keller and Gollwitzer (2017) found that participants in a deliberative mindset on average

stopped pumping earlier on each balloon than participants in an implemental mindset, thus saving more balloons but foregoing potential monetary rewards by being too risk-averse. In line with these findings, Winterich and Nenkov (2015) reported four studies showing that people in a deliberative mindset exhibited an increased open-mindedness with respect to information about high saving rates of others. This, in turn, led to higher saving as compared to participants who did not receive such information and participants who received the information but were not in a deliberative mindset. This pattern of findings suggests that the deliberative mindset per se did not increase savings but rather increased open-mindedness for information in favor of high savings.

6.3.2 Implementation Intentions

Research on implementations intentions can be grouped into effect studies and process studies (for an overview, see Gollwitzer, 2014; see also

Sidebar 6.2 for how to study implementation intentions). In the effect studies, research has shown that implementation intentions facilitate goal attainment by promoting the initiation of goal striving, the shielding of ongoing goal striving from unwanted disruptive influences, the disengagement from failing courses of goal-directed action, and the conservation of capability for future goal striving (Gollwitzer & Sheeran, 2006). These findings held true for goals of different behavioral domains (e.g., health, achievement, interpersonal) and samples (e.g., age groups, cultures, various clinical samples).

In the process studies, it was demonstrated that the effectiveness of implementation intentions is rooted in bottom-up control of the specified goal-directed responses by the respective situational cues (e.g., Gilbert et al., 2009; see also Chapter 39, this volume). These process studies explored the mental representation of the situational cues and the link between the specified cues and the respective response; it was found that

Sidebar 6.2 Experimenting with implementation intentions

In a typical implementation intention study, a between-participants design used: In the control group the participants are only given information about the task at hand (e.g., performing a math test), in the goal condition the participants are asked to form the intention to do well on the task (e.g., to succeed on the math test), and in the implementation intention condition participants are asked in addition to forming this goal to plan out in advance how they want to implement this goal (e.g., "As soon as I have solved one of the test items, then I will immediately move on to the next."). The planning is triggered by questions on when, where, and how they want to act on their goal or by asking them to fill in a prepared statement: "If (opportunity/obstacle/critical condition/cue) . . . , then I will (enact goal-directed response) . . . !" In some cases, the if-then plan is already specified by the experimenter/interventionist and provided to the research participant.

Crucially, individuals in the mere goal condition and individuals in the implementation intention condition share the same underlying goal and significant parts of knowledge about how people can act to facilitate goal attainment. Forming implementation intentions is an easy-to-use self-regulation tool, as individuals commonly come up with a suitable plan on their own or readily adopt the given one (see also Chapter 39, this volume).

implementation intentions heighten the cognitive accessibility of the critical cue and they strengthen the associative link between the cue and the planned response (e.g., Webb & Sheeran, 2007, 2008). Moreover, numerous experimental studies demonstrated that performing the planned response in the presence of the critical cues runs off in an automatic fashion; it is fast, efficient, and does not require conscious intent (e.g., Bayer et al., 2009; Sheeran, Webb, & Gollwitzer, 2005). Finally, brain studies indicate that action control by implementation intentions activates those brain regions that are known to be involved in automatic, bottom-up control by situational cues (e.g., Hallam et al., 2015).

Recent research on implementation intentions has addressed the question of whether the influence of critical situations that cause unwanted impulsive and habitual responses can be countered by the formation of implementation intentions. It has done so by targeting cognitive, affective, and behavioral responses. With respect to cognitive responses, it has been shown that implicit stereotyping can be successfully controlled by forming implementation intentions like “*whenever I see a black face on the screen, I will think the word ‘safe’*” or “*if I see a person, then I will ignore his race*” (e.g., Stewart & Payne, 2008; Mendoza, Gollwitzer, & Amodio, 2010). With respect to affective responses, it was found that forming the plan “*if I see a spider, then I will remain calm and relaxed*” managed to curb fear responses in participants with spider phobia (Schweiger Gallo et al., 2009); and, with respect to the control of habitual behavioral responses, Marquardt and colleagues (2017) recently found that stroke patients with a mild-to-moderate hand paresis who formed task-specific plans like “*when the green arrow points to the right, then I will press the left key instantly*” performed better on the Simon Task, which assesses a person’s control over habitual hand movements, and this was true for the affected as well as the nonaffected hand. Taken together, these lines of

research show the effective regulation of affective, behavioral, and cognitive responses toward critical stimuli.

A further new line of research focuses on the question of whether implementation intentions can also control social phenomena known to be enacted automatically, such as mimicry (Wieber, Gollwitzer, & Sheeran, 2014) or social projection (A. Gollwitzer et al., 2017). In all of the social phenomena studied, implementation intentions successfully down-regulated, and sometimes even up-regulated, these phenomena. Finally, recent research has asked whether a plan that specifies a switch to reflective thinking once the critical situation is encountered can be used to halt acting on one’s habits and impulses (e.g., Doerflinger, Martiny-Huenger, & Gollwitzer, 2017; Bieleke et al., 2017). Findings suggested that implementation intentions can automate the initiation of deep thinking; behavioral guidance by unwanted impulses and habits was prevented by planning to think when thinking was needed.

6.4 Evidence Base for Use of Theory in Changing Behavior

To gain insight into the overall effectiveness of forming implementation intentions in promoting behavioral performance and goal attainment, a meta-analysis of published meta-analyses of implementation intention effects was conducted. Six reviews were located, which focused on multiple behaviors (Gollwitzer & Sheeran, 2006), specific behavioral categories (diet – Adriaanse et al., 2011; physical activity – Bélanger-Gravel, Godin, & Amireault, 2013; da Silva et al., 2018), affective outcomes (Webb et al., 2012), and clinical/psychiatric samples (Toli, Webb, & Hardy, 2016). The number of tests in the primary meta-analyses ranged from 13 to 93, and average effect sizes ranged from $d_+ = 0.24$ to $d_+ = 0.99$ (see Figure 6.2). The sample-weighted average effect size across these meta-analyses was $d_+ = 0.54$ (95% CI = 0.51 to 0.57). The *What Works Clearinghouse* (WWC), a federal

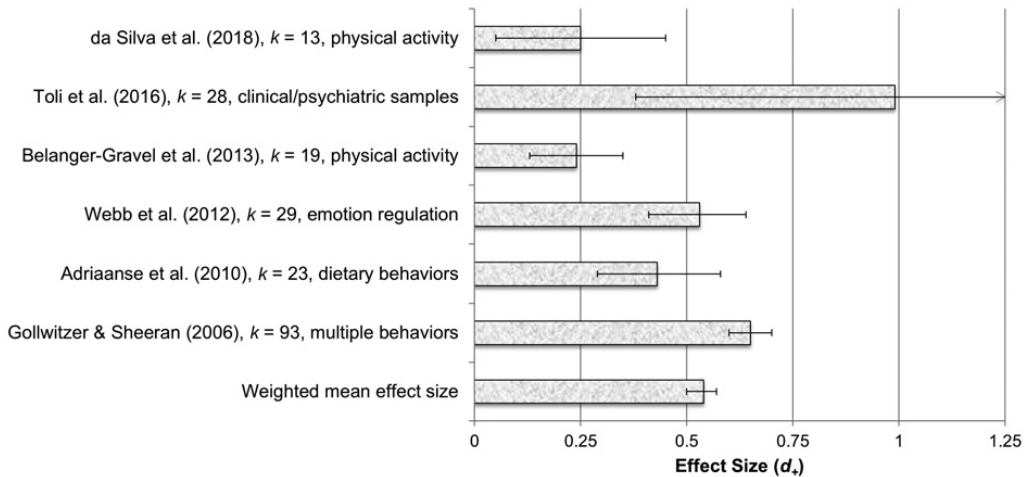


Figure 6.2 Meta-analysis of meta-analyses of implementation intention effects on goal achievement

Sidebar 6.3 Strong tests of the behavioral impact of implementation intentions

Although there appears to be no formal definition of a “strong test” of a behavioral intervention, several criteria can be proposed (see Chapter 22, this volume). The intervention should be effective (1) at scale (i.e., among large, representative samples); (2) using objective outcomes; (3) over extended time periods; and (4) for “difficult” or “complex” behaviors. Implementation intention research has met each of these criteria.

Neter et al.’s (2014) memorably titled paper “From the bench to public health” reported a field experiment of if-then planning among ~30,000 people eligible for colorectal cancer screening. Electronic health records showed a substantial increase in fecal occult blood test adherence ($OR = 1.17$, $p < 0.001$). Martin et al. (2011) observed a 42 percent relative reduction in rates of clinically verified pregnancy two years later among socioeconomically deprived teenage women who formed implementation intentions in relation to their contraceptive use. Conner et al. (2019) tested the impact of if-then planning on smoking uptake among 6,155 adolescents over a time period of four years. The intervention led to a 6.5 percent reduction in the number of adolescents who had ever smoked ($p < 0.001$). Statistically significant effects of implementation intentions have thus been observed even in strong tests of intervention effects and for complex behaviors that have considerable importance in terms of public health.

repository of “gold-standard” evidence on education programs, characterizes effect sizes of $d_+ \geq 0.25$ as “substantively important” (WWC, 2014, p. 23). It thus seems fair to conclude that forming implementation intentions is, at minimum, “substantively important” for promoting behavior change (see Sidebar 6.3).

6.5 Summary, Conclusion, and Outlook

Both mindset inductions and implementation intentions have been used to instigate behavior change in various domains. Nevertheless, there are still many open questions. With respect to

mindsets (Gollwitzer, 2012), for instance, the role of affect and affect-rich versus affect-poor information has not yet been systematically addressed. In contexts such as health risk communication, medical or moral decision-making, or when facing anxiety-provoking situations, individuals are exposed to affective information regarding negative future outcomes or have to make decisions in emotionally laden situations. Another issue relates to the emergence of a motivational task in a volitional action phase (Brandstätter & Schüler, 2013; Nenkov & Gollwitzer, 2012). What happens when people have to engage in renewed deliberation after they have crossed the Rubicon? Research addressing this question could contribute to a better understanding of how linear transitions between the four action phases are.

Finally, implementation intentions can be combined with mental contrasting (Oettingen, 2014; Cross & Sheffield, 2019) to generate a powerful self-regulation strategy that enables people to deal with new and changing demands by themselves. Behavior change brought on by an omniscient choice architect (e.g., nudging; Thaler & Sunstein, 2008) cannot be generalized to new contexts as individuals are often oblivious to the effects of choice architecture or are not in a position to change choice architecture by themselves. In contrast, mental contrasting with implementation intentions (Oettingen, 2019) offers a meta-cognitive self-regulation tool that can be used as needed and in relation to any wishes the person may have. Mental contrasting prompts participants to first think about their desired futures, thus clarifying what they want to attain in the future, and then contrast the desired positive outcomes with their current personal obstacles standing in the way of attaining them. Mental contrasting leads to higher energization and stronger commitments given that individuals are confident that they can actually reach the desired outcome. Mental contrasting also helps participants to identify key obstacles to the realization of their wishes, obstacles that can be specified in

implementation intentions that link the obstacle with a goal-directed response that can overcome it. Mental contrasting with implementation intentions has been found to be even more effective than implementation intentions or mental contrasting on its own (Adriaanse et al., 2010), and warrants testing in future behavior change interventions.

References

- Adriaanse, M. A., Oettingen, G., Gollwitzer, P. M., Hennes, E., de Ridder, D. T. D., & de Wit, J. B. F. (2010). When planning is not enough: Fighting unhealthy snacking habits by mental contrasting with implementation intentions (MCII). *European Journal of Social Psychology, 40*, 1277–1293. <https://doi.org/10.1002/ejsp.730>
- Adriaanse, M. A., Vinkers, C. D. W., de Ridder, D. T. D., Hox, J. J., & de Wit, J. B. F. (2011). Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence. *Appetite, 56*, 183–193. <https://doi.org/10.1016/j.appet.2010.10.012>
- Bayer, U. C., Achtziger, A., Gollwitzer, P. M., & Moskowitz, G. B. (2009). Responding to subliminal cues: Do if-then plans facilitate action preparation and initiation without conscious intent? *Social Cognition, 27*, 183–201. <https://doi.org/10.1521/soco.2009.27.2.183>
- Bayer, U. C., & Gollwitzer, P. M. (2005). Mindset effects on information search in self-evaluation. *European Journal of Social Psychology, 35*, 313–327. <https://doi.org/10.1002/ejsp.247>
- Bélanger-Gravel, A., Godin, G., & Amireault, S. (2013). A meta-analytic review of the effect of implementation intentions on physical activity. *Health Psychology Review, 7*, 23–54. <https://doi.org/10.1080/17437199.2011.560095>
- Bieleke, M., Gollwitzer, P. M., Oettingen, G., & Fischbacher, U. (2017). Social value orientation moderates the effects of intuition versus reflection on responses to unfair ultimatum offers. *Journal of Behavioral Decision Making, 30*, 569–581. <https://doi.org/10.1002/bdm.1975>
- Brandstätter, V., Giesinger, L., Job, V., & Frank, E. (2015). The role of deliberative versus

- implemental mindsets in time prediction and task accomplishment. *Social Psychology*, 46, 104–115. <https://doi.org/10.1027/1864-9335/a000231>
- Brandstätter, V., Lengfelder, A., & Gollwitzer, P. M. (2001). Implementation intentions and efficient action initiation. *Journal of Personality and Social Psychology*, 81, 946–960. <https://doi.org/10.1037//0022-3514.81.5.946>
- Brandstätter, V., & Schüler, J. (2013). Action crisis and cost-benefit thinking: A cognitive analysis of a goal-disengagement phase. *Journal of Experimental Social Psychology*, 49, 543–553. <https://doi.org/10.1016/j.jesp.2012.10.004>
- Büttner, O. B., Wieber, F., Schulz, A. M., Bayer, U. C., Florack, A., & Gollwitzer, P. M. (2014). Visual attention and goal pursuit: Deliberative and implemental mindsets affect breadth of attention. *Personality and Social Psychology Bulletin*, 40, 1248–1259. <https://doi.org/10.1177/0146167214539707>
- Conner, M., Grogan, S., West, R. et al. (2019). Effectiveness and cost-effectiveness of repeated implementation intention formation plus anti-smoking messages on adolescent smoking initiation: A cluster randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 87, 422–432. <https://dx.doi.org/10.1037%2Fccp0000387>
- Cross, A., & Sheffield, D. (2019). Mental contrasting for health behaviour change: A systematic review and meta-analysis of effects and moderator variables. *Health Psychology Review*, 13, 209–225. <https://doi.org/10.1080/17437199.2019.1594332>
- da Silva, M. A. V., São-João, T. M., Brizon, V. C., Franco, D. H., & Mialhe, F. L. (2018). Impact of implementation intentions on physical activity practice in adults: A systematic review and meta-analysis of randomized clinical trials. *PLoS ONE*, 13, e0206294. <https://doi.org/10.1371/journal.pone.0206294>
- Dennehy, T. C., Ben-Zeev, A., & Tanigawa, N. (2014). “Be prepared”: An implemental mindset for alleviating social-identity threat. *British Journal of Social Psychology*, 53, 585–594. <https://doi.org/10.1111/bjso.12071>
- Doerflinger, J., Martiny-Huenger, T., & Gollwitzer, P. M. (2017). Planning to deliberate thoroughly: If-then planned deliberation increases the adjustment of decisions to newly available information. *Journal of Experimental Social Psychology*, 69, 1–12. <https://doi.org/10.1016/j.jesp.2016.10.006>
- Fujita, K., Gollwitzer, P. M., & Oettingen, G. (2007). Mindsets and pre-conscious open-mindedness to incidental information. *Journal of Experimental Social Psychology*, 43, 48–61. <https://doi.org/10.1016/j.jesp.2005.12.004>
- Gilbert, S. J., Gollwitzer, P. M., Cohen, A.-L., Burgess, P. W., & Oettingen, G. (2009). Separable brain systems supporting cued versus self-initiated realization of delayed intentions. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35, 905–915. <https://doi.org/10.1037/a0015535>
- Gollwitzer, A., Schwoerer, B., Stern, C., Gollwitzer, P. M., & Bargh, J. A. (2017). Down and up regulation of a highly automatic process: Implementation intentions can both decrease and increase social projection. *Journal of Experimental Social Psychology*, 70, 19–26. <https://doi.org/10.1016/j.jesp.2016.12.006>
- Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins & R. Sorrentino (Eds.), *The Handbook of Motivation and Cognition: Foundations of Social Behavior*, Vol. 2 (pp. 53–92). New York: Guilford Press.
- Gollwitzer, P. M. (1993). Goal achievement: The role of intentions. *European Review of Social Psychology*, 4, 141–185. <https://doi.org/10.1080/14792779343000059>
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, 4, 493–503. <https://doi.org/10.1037/0003-066X.54.7.493>
- Gollwitzer, P. M. (2012). Mindset theory of action phases. In P. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of Theories of Social Psychology* (pp. 526–545). London: SAGE.
- Gollwitzer, P. M. (2014). Weakness of the will: Is a quick fix possible. *Motivation and Emotion*, 38, 305–22. <https://doi.org/10.1007/s11031-014-9416-3>
- Gollwitzer, P. M. (2018). The goal concept: A helpful tool for theory development and testing in

- motivation science. *Motivation Science*, 18, 185–205. <https://doi.org/10.1037/mot0000115>
- Gollwitzer, P. M., & Keller, L. (2016). Mindset theory. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 1–8). Cham: Springer International. https://doi.org/10.1007/978-3-319-28099-8_1141-1
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, 38, 69–119. [https://doi.org/10.1016/S0065-2601\(06\)38002-1](https://doi.org/10.1016/S0065-2601(06)38002-1)
- Hallam, G. P., Webb, T. L., Sheeran, P. et al. (2015). The neural correlates of emotion regulation by implementation intentions. *PLoS ONE*, 10, e0119500. <https://doi.org/10.1371/journal.pone.0119500>
- Heckhausen, H., & Gollwitzer, P. M. (1987). Thought contents and cognitive functioning in motivational versus volitional states of mind. *Motivation and Emotion*, 11, 101–120. <https://doi.org/10.1007/BF00992338>
- Heckhausen, H., Gollwitzer, P. M., & Weinert, F. E. (1987). *Jenseits des Rubikon: Der Wille in den Humanwissenschaften [Beyond the Rubicon: The Will in the Humanities]*. Heidelberg: Springer.
- Hügelschäfer, S., & Achtziger, A. (2014). On confident men and rational women: It's all on your mind(set). *Journal of Economic Psychology*, 41, 31–44. <https://doi.org/10.1016/j.joep.2013.04.001>
- Keller, L., & Gollwitzer, P. M. (2017). Mindsets affect risk perceptions and risk-taking behavior: Optimistic bias and the BART. *Social Psychology*, 48, 135–147. <https://doi.org/10.1027/1864-9335/a000304>
- Lejuez, C. W., Aklin, W. M., Jones, H. A. et al. (2003). The Balloon Analogue Risk Task (BART) differentiates smokers and nonsmokers. *Experimental and Clinical Psychopharmacology*, 11, 26–33. <https://doi.org/10.1037/1064-1297.11.1.26>
- Lejuez, C. W., Aklin, W. M., Zvolensky, M. J., & Pedulla, C. M. (2003). Evaluation of the Balloon Analogue Risk Task (BART) as a predictor of adolescent real-word risk-taking behaviours. *Journal of Adolescence*, 26, 475–479. [https://doi.org/10.1016/S0140-1971\(03\)00036-8](https://doi.org/10.1016/S0140-1971(03)00036-8)
- Lejuez, C. W., Read, J. P., Kahler, C. W. et al. (2002). Evaluation of a behavioral measure of risk taking: The Balloon Analogue Risk Task (BART). *Journal of Experimental Psychology: Applied*, 8, 75–84. <https://doi.org/10.1037//1076-898X.8.2.75>
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration. In J. M. Hunt (Ed.), *Personality and the Behavior Disorders* (pp. 333–378). Oxford: Ronald Press.
- Marquardt, M. K., Cohen, A.-L., Gollwitzer, P. M., Gilbert, S. J., & Dettmers, C. (2017). Making if-then plans counteracts learned non-use in stroke patients: A proof-of-principle study. *Restorative Neurology and Neuroscience*, 35, 537–545. <https://doi.org/10.3233/RNN-170748>
- Martin, J., Sheeran, P., Slade, P., Wright, A., & Dibble, T. (2011). Durable effects of implementation intentions: Reduced rates of confirmed pregnancy at two years. *Health Psychology*, 30, 368–373. <https://doi.org/10.1037/a0022739>
- McCrea, S. M., & Vann, R. J. (2018). Postactional goal pursuit: Consequences of task completion for thought content, affect, and behavioral intentions. *Motivation and Emotion*, 42, 852–870. <https://doi.org/10.1007/s11031-018-9713-3>
- Mendoza, S. A., Gollwitzer, P. M., & Amodio, D. M. (2010). Reducing the expression of implicit stereotypes: Reflexive control through implementation intentions. *Personality and Social Psychology Bulletin*, 36, 512–523. <https://doi.org/10.1177/0146167210362789>
- Nenkov, G. Y., & Gollwitzer, P. M. (2012). Pre- versus postdecisional deliberation and goal commitment: The positive effects of defensiveness. *Journal of Experimental Social Psychology*, 48, 106–121. <https://doi.org/10.1016/j.jesp.2011.08.002>
- Neter, E., Stein, N., Barnett-Griness, O., Rennert, G., & Hagoel, L. (2014). From the bench to public health: Population-level implementation intentions in colorectal cancer screening. *American Journal of Preventive Medicine*, 46, 273–280. <https://doi.org/10.1016/j.amepre.2013.11.008>
- Oettingen, G. (2014). *Rethinking Positive Thinking: Inside the New Science of Motivation*. New York: Penguin Random House.

- Oettingen, G. (2019). WOOP my life. Website. www.woopmylife.org
- Orbell, S., & Sheeran, P. (2000). Motivational and volitional processes in action initiation: A field study of the role of implementation intentions. *Journal of Applied Social Psychology, 30*, 780–797. <https://doi.org/10.1111/j.1559-1816.2000.tb02823.x>
- Puca, R. M. (2001). Preferred difficulty and subjective probability in different action phases. *Motivation and Emotion, 25*, 307–326. <https://doi.org/10.1023/A:1014815716476>
- Schweiger Gallo, I., Keil, A., McCulloch, K. C., Rockstroh, B., & Gollwitzer, P. M. (2009). Strategic automation of emotion regulation. *Journal of Personality and Social Psychology, 96*, 11–31. <https://doi.org/10.1037/a0013460>
- Sheeran, P., Webb, T. L., & Gollwitzer, P. M. (2005). The interplay between goal intentions and implementation intentions. *Personality and Social Psychology Bulletin, 31*, 87–98. <https://doi.org/10.1177/0146167204271308>
- Stewart, B. D., & Payne, B. K. (2008). Bringing automatic stereotyping under control: Implementation intentions as efficient means of thought control. *Personality and Social Psychology Bulletin, 34*, 1332–1345. <https://doi.org/10.1177/0146167208321269>
- Taylor, S. E., & Gollwitzer, P. M. (1995). Effects of mindsets on positive illusions. *Journal of Personality and Social Psychology, 69*, 213–226. <https://doi.org/10.1037/0022-3514.69.2.213>
- Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven, CT: Yale University Press.
- Toli, A., Webb, T. L., & Hardy, G. E. (2016). Does forming implementation intentions help people with mental health problems to achieve goals? A meta-analysis of experimental studies with clinical and analogue samples. *British Journal of Clinical Psychology, 55*, 69–90. <https://doi.org/10.1111/bjc.12086>
- Webb, T. L., Schweiger Gallo, I., Miles, E., Gollwitzer, P. M., & Sheeran, P. (2012). Effective regulation of affect: An action control perspective on emotion regulation. *European Review of Social Psychology, 23*, 143–186. <https://doi.org/10.1080/10463283.2012.718134>
- Webb, T. L., & Sheeran, P. (2007). How do implementation intentions promote goal attainment? A test of component processes. *Journal of Experimental Social Psychology, 43*, 295–302. <https://doi.org/10.1016/j.jesp.2006.02.001>
- Webb, T. L., & Sheeran, P. (2008). Mechanisms of implementation intention effects: The role of goal intentions, self-efficacy, and accessibility of plan components. *British Journal of Social Psychology, 47*, 373–395. <https://doi.org/10.1348/014466607X267010>
- Wieber, F., Gollwitzer, P. M., & Sheeran, P. (2014). Strategic regulation of mimicry effects by implementation intentions. *Journal of Experimental Social Psychology, 53*, 31–39. <https://doi.org/10.1016/j.jesp.2014.02.002>
- Winterich, K. P., & Nenkov, G. Y. (2015). Save like the Joneses: How service firms can utilize deliberation and informational influence to enhance consumer well-being. *Journal of Service Research, 18*, 384–404. <https://doi.org/10.1177/1094670515570268>
- WWC (What Works Clearinghouse). (2014). *WWC Procedures and Standards Handbook (Version 3.0)*. US Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, and What Works Clearinghouse. https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_v3_0_standards_handbook.pdf