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Article *in* Social and Personality Psychology Compass · September 2016

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Social and Personality Psychology Compass 10/9 (2016), 503–518, 10.1111/spc3.12265

The Intention–Behavior Gap

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Abstract

Bitter personal experience and meta-analysis converge on the conclusion that people do not always do the things that they intend to do. This paper synthesizes research on intention–behavior relations to address questions such as: How big is the intention–behavior gap? When are intentions more or less likely to get translated into action? What kinds of problems prevent people from realizing their intentions? And what strategies show promise in closing the intention–behavior gap and helping people do the things that they intend to do?

Goal intentions are people's self-instructions to achieve desired outcomes (e.g., "I intend to finish this paper before I die!"; Triandis, 1980), and behavioral intentions are self-instructions to perform particular actions directed towards attaining these outcomes (e.g., "I intend to spend Monday morning working on this paper!"). Intentions capture both the level of the set goal or behavior (e.g., the number of hours that the person intends to spend working on their paper) and the person's level of commitment (e.g., how determined they are to devote that number of hours to working on the paper). Although most behavior is habitual or involves responses that are triggered automatically by situational cues (e.g., Bargh, 2006; Wood & Neal, 2007), forming intentions can be crucial for securing long-term goals (Baumeister & Bargh, 2014; Kuhl & Quirin, 2011). The concept of intention has thus proved invaluable for researchers concerned with *behavior change*, and interventions designed to promote public health, energy conservation, and educational and organizational outcomes generally rely on frameworks that construe intentions as a key determinant of actions (e.g., Ajzen, 1991; Bandura, 1996; Locke & Latham, 1992; Rogers, 1983).

Numerous correlational studies indicate that intentions predict behavior. For instance, Sheeran (2002) meta-analyzed 10 previous meta-analysis (422 studies in total) and found a 'large' sample-weighted average correlation between intentions measured at one time-point and measures of behavior taken at a subsequent time-point ($r_+ = 0.53$). Moreover, intention offers superior prediction of behavior in correlational tests compared to other cognitions including (explicit and implicit) attitudes, norms, self-efficacy, and perceptions of risk and severity (e.g., McEachan et al., 2011; Sheeran, Harris, & Epton, 2014; Sheeran, Klein, & Rothman, in press) as well as personality factors (e.g., Chiaburu et al., 2011; Poropat, 2009; Rhodes & Smith, 2006). These findings would seem to suggest that forming an intention to change is vital if people are to initiate new behaviors or to alter courses of action that are no longer seen as desirable.

The Intention–Behavior Gap: The Proverbial 'Road to Hell' Is Well Paved

How well a variable predicts behavior in correlational studies does not indicate how much change in behavior accrues from manipulating that variable, however (Sheeran, Klein, & Rothman, in press). A meta-analysis of experiments that manipulated intention showed that a

medium-to-large-sized change in intentions led to only a small-to-medium-sized change in behavior ($d_+ = .36$; Webb & Sheeran, 2006; see also Rhodes & Dickau, 2012). Findings from statistical simulations also converge on the conclusion that changing intentions does not guarantee behavior change (Fife-Schaw, Sheeran, & Norman, 2007). To identify the source of the discrepancy between intentions and behavior, Sheeran (2002; Orbell & Sheeran, 1998), decomposed the intention–behavior relation into a 2 (intend to act vs. do not intend to act) by 2 (subsequently act vs. do not act) matrix. This analysis revealed that it is people who intend to change their behavior but do not ("inclined abstainers") who are mainly responsible for the intention–behavior gap (see Godin & Conner, 2008; Rhodes & de Brujin, 2013, for equivalent findings).

Despite the considerable research on goals, motivation, and self-regulation during the past 15 years (see, e.g., Aarts & Elliot, 2012; Moskowitz & Grant, 2009; Shah & Gardner, 2008, Vohs & Baumeister, 2016, for summaries), much of this work does not explicitly test the relationship between intention and behavior. The present review therefore focuses squarely on the intention–behavior gap – on research relevant to understanding the predicament of inclined abstainers, and how the translation of intentions into action can be improved. Adopting this perspective means that three strands of research can be delineated that concern (a) the qualities of the focal intention that make subsequent action more or less likely, (b) the challenges that need to be met as people strive to enact their intentions, and (c) the self-regulatory tools that can help people to realize their intentions. We discuss each of these issues in turn.

Qualities of Intention: Not All Intentions Take the Road to Hell

The nature of the focal goal, the basis of intention, and properties of intention each influence the quality of the respective intention and its likelihood of enactment.

Goal dimensions

The contents or structural features of the specified goal can have an important bearing on the likelihood that the intention to achieve that goal is realized (for reviews, see Fujita & MacGregor, 2012; Grant & Gelety, 2009). In general, evidence suggests that goals that are framed in terms of promotion (vs. prevention; Higgins, 1997), autonomy (vs. control; Ryan & Deci 2000), and learning or mastery (vs. performance; Dweck and Leggett, 1988; Elliot & Church, 1997) are more likely to be attained. Similarly, concrete or specific goals (e.g., "gain an *A* grade") engender better performance than general or 'do your best' goals (for a review, see Locke & Latham, 2013).

Set goals often are over-optimistic which can reduce the likelihood that they are achieved. For instance, research on the 'planning fallacy' indicates that undergraduates underestimate the amount of time that it will take them to complete coursework (Buehler, Griffin, & Ross, 1994), and research on the 'cold-to-hot empathy gap' indicates that setting goals in a cold (e.g., calm or satiated) state can reduce goal attainment because the impact of visceral states (e.g., arousal, hunger) is not taken into account (e.g., Nordgren, van der Pligt, & van Harreveld, 2008). On the other hand, Zhang and Fishbach (2010) found that optimistic goal setting can constitute a self-control strategy that helps people to deal with obstacles during goal pursuit. People allocate more effort to the pursuit of optimistic goals than more realistic goal setting and as a result perform better. Thus, optimistic goals may contribute to the intention–behavior gap but can, at the same time, lead to greater overall performance.

Not surprisingly, evidence also suggests that intentions are more likely to be translated into action when respective behaviors are easier to perform (Sheeran, Trafimow, & Armitage, 2003). Goal difficulty is a function of the resources, ability, skills, co-operation, opportunities,

and time and effort needed to realize the goal. Consistent with this idea, socioeconomic status (SES) appears to moderate the intention–behavior relation (SES; Conner et al., 2013). Interestingly, however, people's *beliefs* about the difficulty of performing the behavior or the extent to which they have control over behavioral performance (self-efficacy and perceived behavioral control, respectively) do not consistently moderate the intention–behavior relationship (Armitage & Conner, 2001; Sheeran, 2002), perhaps because people generally under-estimate the difficulty of performing behaviors (DiBonaventura & Chapman, 2008; Sheeran et al., 2003).

Basis of the intention

Several factors that guide intention formation (i.e., form the basis of the intention) also influence whether those intentions are realized. Consistent with self-determination theory (SDT; e.g., Deci & Ryan, 2000), evidence suggests that intentions based on personal beliefs about the outcomes of acting (attitudes) better predict behavior than intentions based on social pressure to act (norms) (Sheeran & Orbell, 1999). Intentions based more on feelings about performing the behavior (affective attitudes) than on thoughts about the likely consequences of acting (cognitive attitudes) are also associated with improved prediction of behavior (Conner et al., 2016;Keer, Conner, Putte & Neijens, 2014). Findings also indicate that greater feelings of moral obligation and anticipated regret about failing to act increase the likelihood that intentions are enacted (Abraham & Sheeran, 2004; Conner et al., 2006; Godin, Conner, & Sheeran, 2005; Godin et al., 2014; Sheeran & Abraham, 2003; Sheeran & Orbell, 1999). Finally, many intentions present a conflict between what people want to do and what they feel they should do (Milkman, Rogers, & Bazerman, 2008). At the present moment, for instance, I *should* continue working on this paper but I *want* to take a break. Taylor, Webb, and Sheeran (2014) found that such conflicts can give rise to justifications for indulgence that can undermine the realization of intentions. Taken together with research on self-licensing (e.g., De Witt Huberts, Evers, & De Ridder, 2012; 2014a, 2014b), it seems that there are times when people willingly undermine their own intentions by justifying so doing to themselves.

The extent to which intentions are relevant to the persons' identity can also influence the likelihood that they are achieved. For example, Sheeran and Orbell (2000a) found that people for whom exercising was an important part of their self-concept ("exerciser schematics") better translated their intentions to exercise into action compared to participants who did not think of themselves as 'an exerciser'. On the other hand, when behavioral intentions serve an identity goal and other people take notice of the person's intention, intention realization is compromised – because the person feels they possess the identity and no longer needs to act on their intention (Gollwitzer et al., 2009).

Experience with a behavior, or how often a person has performed the relevant behavior in the past, appears to have paradoxical effects on intention–behavior relations. On the one hand, several studies indicate that greater experience serves to stabilize intentions, meaning that they are more likely to be enacted (e.g., Doll & Ajzen, 1992; Kashima, Gallois, & McCamish, 1993; Sheeran & Abraham, 2003). On the other hand, research on habits indicates that greater experience reduces intention–behavior consistency because encountering the relevant contextual cues (e.g., a particular time, place, person) elicits the behavior automatically – habit performance bypasses intentional control (e.g., Ouellette & Wood, 1998; Verplanken & Aarts, 1999; Wood & Neal, 2007). Sheeran, Godin et al. (in press) proposed that this paradox could be resolved by hypothesizing that the impact of experience on the relationship between intentions and behavior is captured by an inverted U-shaped curve. Findings supported the hypothesis: Greater experience initially enhanced the predictive validity of intention (because experience

stabilizes intentions); after a certain point, however, greater experience merely reflects increased automatization of behavior and so the predictive validity of intention declined. Thus, experience with a behavior can serve both to strengthen *and* weaken intention–behavior consistency.

Properties of intention

Properties of intentions also influence intention–behavior consistency. Studies of properties of intentions measure not only the direction and intensity of an intention (e.g., "I intend to finish this paper before I die!") but also other features such as accessibility (indexed by response latencies to questions about intention), certainty (e.g., "I am certain that my intention will not change!"), and temporal stability (e.g., the within-participants correlation between measures of intention taken at two time-points) (Cooke & Sheeran, 2013). Several lines of research indicate that intention stability is a better indicator of the strength of the respective intention than accessibility or certainty. First, intention stability is a more powerful moderator of the intention–behavior relation than the other indicators (Conner & Godin, 2007; Cooke & Sheeran, 2013; Sheeran & Abraham, 2003; see Cooke & Sheeran, 2004, for a meta-analysis). Second, temporal stability is associated with improved processing of goal-relevant information and increased resistance to attacks on intention (Cooke & Sheeran, 2013). Finally, evidence indicates that intention stability mediates the influence of other moderators of the intention–behavior relationship such as attitudinal versus normative control, anticipated regret, self-schemas, experience with the behavior, and intention certainty (Keer et al., 2014; Sheeran & Abraham, 2003; Turchik & Gidycz, 2012).

The evidence outlined in this section indicates that not all intentions take the road to hell and that it is possible to predict whether or not intentions will be enacted. Although research on goal dimensions has not yet been integrated with research on the basis of intention or studies of intention properties, accumulated evidence suggests that intention stability is the best indicator of the likelihood that an intention will be realized. Factors that form the basis of intention appear to influence rates of intention realization precisely because they lead to stable intentions, and stable intentions have powerful effects, even moderating the consistency between measures of intentions and behavior taken 6 years apart (Conner, Norman, & Bell, 2002).

The *T*asks of *R*ealizing *I*ntentions and Go*als* (TRIALS): Negotiating the Paving on the Road to Hell

Although forming intentions instigates psychological processes that support the realization of those intentions (e.g., improved processing of goal-related information; see Johnson, Chang, & Lord, 2006, for a review), research on the intention–behavior gap makes it clear that these processes alone do not guarantee intention realization. As people strive to enact their intentions, they can face various self-regulatory challenges in aligning their thoughts, feelings, and actions with their intentions (Gollwitzer & Sheeran, 2006, 2009). Self-regulatory problems may be encountered during different phases of goal pursuit and include problems (a) getting started, (b) keeping ongoing goal pursuit on track, and (c) bringing goal pursuit to a successful close (see Figure 1). Below, we use this temporal dimension to identify some key problems and link them to the tasks involved in successfully realizing intentions.

Key problems encountered in getting started include forgetting to act, missing opportunities to act, and failing to engage in preparatory behaviors. For example, Einstein et al. (2003) observed that after a delay of just 5 seconds, 8% of their (young, healthy) participants forgot to enact an intended behavior, and this proportion increased to 24% when participants' attention was divided. Forgetting to act is commonplace and has been implicated in failures to take medication as planned (e.g., O'Carroll et al., 2014; Zogg et al., 2012) and failure to

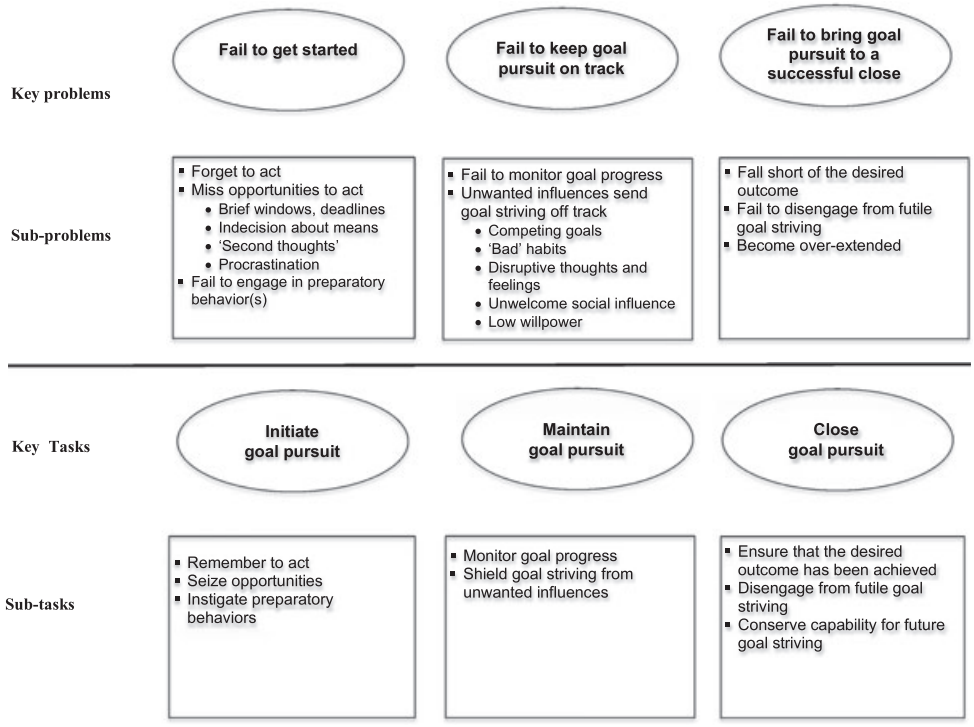

Figure 1 The Tasks Involved in Realizing Intentions Mirror the Problems of Intention Realization.

perform intended energy-saving behaviors (Corradi et al., 2013). Even if people do remember their intention, good opportunities to act may be missed. Failing to capitalize on favorable conditions for acting seems especially likely when such opportunities are brief or infrequent (Dholakia & Bagozzi, 2006), involve deadlines, or when multiple means to achieve the intention are available and the person is undecided about how best to attain their goal. Experiencing 'second thoughts' at the moment of acting (goal revision *in situ*) and procrastination can also cause people to miss opportunities to act. Goal revision *in situ* may occur when people have failed to anticipate the visceral drives present at the moment of acting (Nordgren et al., 2008), are ambivalent about acting, or when the presence of tempting alternative courses of action leads to people to justify indulgence to themselves (Taylor et al., 2014). Procrastination appears to be both dispositionally and situationally determined (e.g., by low conscientiousness and task aversiveness, respectively) and is reliably associated both with the likelihood that people will form intentions (Sirois, 2004) and difficulties in enacting intentions (Steel, 2007). Closely related to the problem of missing opportunities to act is the failure to engage in preparatory behaviors. Many goals involve a series of actions that need to be completed in sequence. For instance, achieving the intention to use a condom during sex demands preparatory behaviors to ensure that condoms are available and that there is agreement with one's partner to use them (e.g., Sheeran, Abraham, & Orbell, 1999). Even strongly intending to use a condom does not ensure that the necessary preparatory behaviors are undertaken (Carvalho et al., 2015; van Empelen & Kok, 2008).

Having successfully initiated goal pursuit, the next self-regulatory problem that people face is how to keep goal pursuit on track. One reason that goal pursuit can be derailed is because people fail to monitor their progress. Evidence suggests that keeping track of progress (e.g.,

using a diary) increases the likelihood that intentions are achieved (see Harkin et al., 2016 for a review), perhaps because monitoring progress serves to identify discrepancies between current and desired states (i.e., it signals the need to act, Myrseth & Fishbach, 2009) and maintains attention on the focal goal (Liberman & Dar, 2009). However, few people monitor their household energy consumption (Webb, Benn, & Chang, 2014), check their bank balances regularly, or keep track of what they are eating (for a review, see Webb, Chang, & Benn, 2013). This motivated avoidance of progress monitoring is termed "The Ostrich Problem" and appears to be rooted in people's desire to maintain favorable views of themselves and their standing with respect to the goal (Webb et al., 2013).

Goal pursuit can also be derailed by competing goals, bad habits, and disruptive thoughts and feelings. Perhaps the most common competing goals involve distractions (activities that consume time or effort needed to realize the focal intention) and temptations (enticing stimuli that afford the opportunity to engage in behavior that is antithetical to the focal intention; see Hofmann et al., 2012). It is particularly challenging that competing goals can be activated automatically by situational features (i.e., without participants being aware that a competing goal has been activated or may impact on behavior). For instance, Gollwitzer et al. (2011) found that priming the goal of moving fast undermined the realization of participants' intentions to drive safely. Situational features can also activate habits, and it is well established that the intention–behavior relation is weaker for habitual as compared to non-habitual behaviors (e.g., Ouellette & Wood, 1998; Webb & Sheeran, 2006). Unwanted thoughts and feelings can also disrupt efforts to enact intentions. Social anxiety (Webb et al., 2010) and test anxiety (Parks-Stamm, Gollwitzer, & Oettingen, 2010) both hamper performance. Similarly, worry about an upcoming psychotherapy appointment predicted non-attendance, despite participants' holding strong intentions to keep the appointment (Sheeran, Aubrey, & Kellett, 2007). In other studies, negative mood and high levels of arousal led to unintended risk behavior (Webb et al., 2010).

Low willpower can also derail goal pursuit. Several studies have shown that participants with low levels of executive function (assessed by Go/No-Go or Stroop task performance) are less successful at translating their intentions into action (Allan, Johnston, & Campbell, 2011; Hall et al., 2008; Wong & Mullan, 2009). Equivalent findings were observed for personality factors relevant to willpower including (low) conscientiousness (Conner, Rodgers, & Murray, 2007), future time orientation (Kovač & Rise, 2007), volitional control (Orbell & Hagger, 2006), and mindfulness (Chatzisarantis & Hagger, 2007). Low willpower is also a state, termed *ego depletion* (Baumeister et al., 1998), and is apparent in poorer performance on a second self-control task following the exertion of self-control on an initial task. Although there is much debate about the magnitude of the ego depletion effect and its interpretation (e.g., Carter et al., 2015; Hagger & Chatzisarantis, 2014; Inzlicht, Schmeichel, & Macrae, 2014), ego depletion appears to moderate the intention–behavior relation. For example, intentions to curb food (Hofmann, Rauch, & Gawronski, 2007) and alcohol intake (Friese, Hofmann, & Wänke, 2008) did not predict subsequent consumption when participants were depleted by an initial self-control task.

The third key problem that people may encounter when striving to achieve their intentions is failing to bring goal pursuit to a successful close. This embraces three issues: withdrawing effort before completing the goal, continuing to engage in a futile course of action, and becoming over-extended. Making good progress towards one's goal can lead to coasting (Carver, 2003), and people may withdraw effort from goal striving prematurely especially if they expect to be successful (Louro et al., 2007). Disengaging from goals becomes necessary when it has become clear that the desired outcome is unattainable or the costs of continued striving outweigh the benefits. The difficulty lies in recognizing that these circumstances have arisen, overcoming self-image or accountability concerns, and effectively calling a halt. Research on escalation of

commitment makes it clear that merely intending to disengage from futile goal striving does not suffice to cease striving (Henderson, Gollwitzer, & Oettingen, 2007). The phenomenon of becoming over-extended is exemplified by John Henry, who worked so hard while competing with a steam-powered hammer that he died of heart failure shortly after his victory. Such over-extension is especially problematic given that people likely have multiple goals that they wish to pursue (e.g., Fitzsimons & Shah, 2012) and that striving for one goal can compromise the pursuit of subsequent goals (Baumeister et al., 1998). In sum, it is clear that forming an intention is merely the starting point for the willful control of action (Gollwitzer & Moskowitz, 1996), and people may face a series of problems in striving to realize their intentions.

Tools for Intention Realization: Repaving the 'Road to Hell'

The various problems that create a gap between intentions and behavior are neither inevitable nor irresolvable, however. Understanding these problems serves to identify the tasks that must be undertaken in order to ensure the effective translation of intentions into action (see Figure 1). For instance, if forgetting to act poses a problem, then the person's task is to remember to initiate action. If goal striving is likely to get sent off track, then the task is to maintain goal pursuit by monitoring progress or managing unwanted influences. And, if the problem involves failing to bring goal pursuit to a successful close, then the self-regulatory tasks are to disengage from futile goal striving and conserve capability for acting on one's other intentions. A variety of tools to tackle these self-regulatory tasks have been developed and are outlined next.

If-then plans

One of the most widely researched and best-validated tools for improving the translation of intentions into action is forming if-then plans or *implementation intentions* (see Gollwitzer, 1999, 2014; Gollwitzer & Sheeran, 2006, 2009, for reviews). If-then planning involves identifying relevant opportunities (e.g., to initiate goal pursuit, to prevent an unwanted influence from occurring) and obstacles (e.g., the particular unwanted thought or feeling that must be dealt with in order to maintain goal pursuit). Having identified good opportunities to act and key obstacles to manage, it is then necessary to (a) select an effective way to respond to each opportunity and obstacle and (b) link the opportunity/obstacle and response using the following, if-then, format: *If* (*opportunity/obstacle*) *arises*, *then I will* (*respond in this way*)!

Forming if-then plans is a highly effective means of accomplishing self-regulatory tasks and reducing the intention–behavior gap. A meta-analysis of 94 studies observed a medium-to-large improvement in rates of goal attainment and behavioral performance compared to merely forming behavioral or goal intentions ($d_+ = 0.65$; Gollwitzer & Sheeran, 2006; see also Adriaanse, Vinkers, et al., 2011; Bélanger-Gravel, Godin, & Amireault, 2013). There is evidence that forming if-then plans can promote the initiation, maintenance, and successful closure of goal pursuit. For example, studies suggest that people better remembered to take their prescribed medication (Brown, Sheeran, & Reuber, 2009; O'Carroll et al., 2013), seized opportunities to act (e.g., Webb & Sheeran, 2004; Webb, Sheeran, & Pepper, 2012), overcame procrastination (Wieber & Gollwitzer, 2010), and engaged in preparatory behaviors (Arden & Armitage, 2008) when they furnished their intentions with if-then plans. Forming implementation intentions has also been shown to help to overcome a variety of unwanted influences including distractions (Wieber et al., 2015), temptations (e.g., Armitage & Arden, 2012), unwelcome social influence (e.g., Rivis & Sheeran, 2013; Wieber et al., 2014), habits (Adriaanse, Gollwitzer, et al., 2011; Armitage, 2008; Webb, Sheeran, & Luszczynska, 2010), and emotions (Sheeran et al., 2007; Varley, Webb & Sheeran, 2011; Webb et al., 2010; for a review, see

Webb, Schweiger Gallo, et al., 2012). People also better disengage from futile goal striving when they form if-then plans (Henderson et al., 2007).

If-then plans help people to act on their intentions because the mental representation of opportunities or obstacles becomes highly accessible (Aarts, Dijksterhuis, & Midden, 1999; Webb & Sheeran, 2004, 2007, 2008) – people are thus able to identify the moment to act when they encounter it. Moreover, strong associations are forged between the opportunity/obstacle and the specified response, meaning that people are in a good position to seize that moment and respond as they had spelled out in advance (Parks-Stamm, Gollwitzer, & Oettingen, 2007; Webb & Sheeran, 2007, 2008). Indeed, evidence indicates that forming if-then plans endows responses with features of automaticity (see Gollwitzer & Sheeran, 2006, for a review). Whereas action control by intentions operates in a 'top-down', deliberative manner, neurophysiological studies indicate that if-then plans operate in 'bottom-up', cue-driven fashion (Gilbert et al., 2009; Hallam et al., 2015), akin to the operation of habits (Gollwitzer, 1999; Wood & Neal, 2007).

Progress monitoring interventions

Monitoring goal progress is a key step between intention formation and goal attainment (e.g., de Bruin et al., 2012; Wilkowski & Ferguson, 2016) and involves comparing the current state or rate of progress against the standard specified in the respective intention. Discrepancies from standards signal the need for self-regulation (e.g., the need to step up efforts). Accordingly, interventions that promote progress monitoring (e.g., via food or activity diaries) should improve the translation of intentions into action. In support of this idea, Harkin et al. (2016) meta-analyzed 138 interventions and observed that a large-sized increase in the frequency of progress monitoring ($d_+ = 1.98$) led to a small-to-medium-sized change in behavior ($d_+ = .40$). Interventions had larger effects when the focus of monitoring (performance of goal-directed behavior or outcomes) matched the desired outcome (a change in behavior or a change in outcomes) and when progress was physically recorded (e.g., in a diary) or made public (e.g., group weighing sessions). Evidence also suggests that interventions designed to promote progress monitoring may be especially effective when they are supported by techniques that facilitate other key self-regulatory processes (e.g., goal setting and goal operating, Michie et al., 2009).

Other approaches

In addition to if-then planning and monitoring progress, there is supportive evidence for other approaches to helping people to translate their intentions into action. Interventions based on the strength model of self-control (Muraven & Baumeister, 2000) such as glucose consumption (Gailliot et al., 2007) and self-control training (Muraven, 2010) have shown promise, although recent research offers more cautious assessments (Beadie & Lane, 2012; Inzlicht & Berkman, 2015; Lange & Eggert, 2014; Miles et al., 2016) or points to alternative mechanisms (Molden et al., 2012). Two kinds of training inspired by dual-process theories (e.g., Strack & Deutsch, 2004) that target impulsive responding or intentional control also show promise. For instance, stop-signal or go/no-go training[1] improved diet and weight control (van Koningsbruggen et al., 2014; Veling et al., 2014), and approach/avoidance training prevented relapse among patients with alcoholism (Eberl et al., 2013). Working memory training (WMT) has also been shown to reduce alcohol consumption (Houben, Wiers & Jansen, 2011), although there is debate about the magnitude and mechanisms underlying the effects (e.g., Shipstead, Redick, & Engle, 2012; von Bastian & Oberauer, 2014). Mindfulness interventions (Harper, Webb, & Raynor, 2013; Papies et al., 2014; Witkiewitz et al., 2013) and embodiment strategies (Sherman, Gangi, & White, 2010) have also demonstrated potential. Finally, insights from

research on habits is also proving valuable in identifying strategies that could help to maintain goal pursuit (e.g., repeating behavior in stable contexts, piggy-backing new behavior(s) onto existing habits, Rothman et al., 2015). Although formal tests of moderation of the intention–behavior relation remain to be undertaken for many of these interventions, findings to date would seem to be indicative of future success in closing the gap between intentions and behavior.

Conclusion

The intention–behavior gap is large – current evidence suggests that intentions get translated into action approximately one-half of the time. The quality of the intention matters, however, and the nature of the focal goal, the basis of intention, and properties of intention each influence rates of intention realization. An analysis of the problems that people encounter in striving to enact their intentions suggests that three tasks must be accomplished to secure intention realization – people need to initiate, maintain, and close goal pursuit. If-then plans, interventions that prompt progress monitoring, and more recent training approaches should each prove helpful in accomplishing these tasks. Finally, while we have emphasized the gap between intention and action, it is also important not to lose sight of intention-behavior consistency and the value that the intention construct holds for practitioners and policy makers concerned with promoting public health, energy conservation, and educational and organizational outcomes. After all, the authors did realize their intention to finish this paper. And we are not dead (yet).

Acknowledgment

This research was supported by grants from the John Templeton Foundation (to PS and TLW; #23145) and the European Research Council (to TLW; ERC-2011-StG-280515). The views expressed are the authors' and do not necessarily reflect the views of the funding bodies.

Short Biographies

Paschal Sheeran completed Bachelor's and Master's degrees at University College Dublin, and a PhD at the University of Sheffield (1997) where he also lectured for 20 years before taking up his current post at the University of North Carolina - Chapel Hill in 2013. Paschal's research focuses on health behavior change and affect regulation (http://psheeran.web.unc.edu).

Thomas Webb is a social and health psychologist. His early research focused on the role of motivation in shaping behavior change. After finding that changes in motivation have only a small effect on behavior, he studied how the effects of motivation can be boosted by forming specific plans known as "implementation intentions." His current research (funded by the European Research Council) investigates the role of monitoring progress in goal striving. Thomas holds a BA in psychology (Sheffield), an MSc in research methods (Bristol), and a PhD in psychology (Sheffield). Following 2 years of lecturing at the University of Manchester, he returned to the Department of Psychology at the University of Sheffield in 2006.

Note

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[1] Stop-signal or go/no-go training involves linking appetitive stimuli (e.g., images of candy) with behavioral stop signals (e.g., a symbol that indicates a response to the specified stimulus should be withheld) in a context where the participants have a prepotent "go" response to stimuli.

References

Aarts, H., Dijksterhuis, A. P., & Midden, C. (1999). To plan or not to plan? Goal achievement of interrupting the performance of mundane behaviors. *European Journal of Social Psychology*, **29**, 971–979. doi: 10.1002/(SICI)1099-0992(199912)29:8<971::AID-EJSP963>3.0.CO;2-A

Aarts, H., & Elliot, A. J. (2012). *Goal-directed behavior*. New York: Psychology Press.

Abraham, C., & Sheeran, P. (2004). Deciding to exercise: The role of anticipated regret. *British Journal of Health Psychology*, **9**(2), 269–278. doi:10.1348/135910704773891096

Adriaanse, M. A., Gollwitzer, P. M., de Ridder, D. T. D., de Wit, J. B. F., & Kroese, F. M. (2011). Breaking habits with implementation intentions: A test of underlying processes. *Personality and Social Psychology Bulletin*, **37**, 502–513. doi:10.1177/0146167211399102

Adriaanse, M. A., Vinkers, C. D., De Ridder, D. T., Hox, J. J., & De Wit, J. B. (2011). Do implementation intentions help to eat a healthy diet? A systematic review and meta-analysis of the empirical evidence. *Appetite*, **56**(1), 183–193. doi:10.1016/j.appet.2010.10.012

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, **50**, 179–211. doi: 10.1016/0749-5978(91)90020-T

Allan, J. L., Johnston, M., & Campbell, N. (2011). Missed by an inch or a mile? Predicting the size of intention–behaviour gap from measures of executive control. *Psychology & Health*, **26**(6), 635–650. doi:10.1080/08870441003681307

Arden, M. A., & Armitage, C. J. (2008). Predicting and explaining transtheoretical model stage transitions in relation to condom-carrying behaviour. *British Journal of Health Psychology*, **13**(4), 719–735. doi:10.1348/135910707X249589

Armitage, C. J. (2008). A volitional help sheet to encourage smoking cessation: A randomized exploratory trial. *Health Psychology*, **27**(5), 557–566. doi:10.1037/0278-6133.27.5.557

Armitage, C. J., & Arden, M. A. (2012). A volitional help sheet to reduce alcohol consumption in the general population: A field experiment. *Prevention Science*, **13**(6), 635–643. doi:10.1007/s11121-012-0291-4

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, **40**, 471–499. doi: 10.1348/014466601164939

Bandura, A. (1996). Failures in self-regulation: Energy depletion or selective disengagement? *Psychological Inquiry*, **7**, 20–24. doi: 10.1207/s15327965pli0701_3

Bargh, J. A. (2006). What have we been priming all these years? On the development, mechanisms, and ecology of nonconscious social behavior. *European Journal of Social Psychology*, **36**(2), 147–168. doi: 10.1002/ejsp.336

Baumeister, R. F., & Bargh, J. A. (2014). Conscious and unconscious: Toward an integrative understanding of human mental life and action. In J. W. Sherman, B. Gawronski, Y. Trope, J. W. Sherman, B. Gawronski, Y. Trope (Eds.) *Dual-process Theories of the Social Mind* (pp. 35–49). New York, NY, US: Guilford Press.

Baumeister, R. F., Bratslavsky, E., Muraven, M. & Tice, D. M. (1998). Ego-depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, **74**, 1252–1265. doi: 10.1037/0022-3514.74.5.1252

Beadie, C. J., & Lane, A. M. (2012). The role of glucose in self-control: Another look at the evidence and an alternative conceptualization. *Personality and Social Psychology Review*, **16**(2), 143–153. doi:10.1177/1088868311419817

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**(1), 23–54. doi:10.1080/17437199.2011.560095

Brown, I., Sheeran, P., & Reuber, M. (2009). Enhancing antiepileptic drug adherence: A randomized controlled trial. *Epilepsy & Behavior*, **16**(4), 634–639. doi:10.1016/j.yebeh.2009.09.014

Buehler, R., Griffin, D., & Ross, M. (1994). Exploring the "planning fallacy": Why people underestimate their task completion times. *Journal of Personality and Social Psychology*, **67**, 366–381. doi: 10.1037/0022-3514.67.3.366

Carter, E. C., Kofler, L. M., Forster, D. E., & McCullough, M. E. (2015). A series of meta-analytic tests of the depletion effect: Self-control does not seem to rely on a limited resource. *Journal of Experimental Psychology: General*, **144**(4), 796–815. doi: 10.1037/xge0000083

Carvalho, T., Alvarez, M. J., Barz, M., & Schwarzer, R. (2015). Preparatory behavior for condom use among heterosexual young men: A longitudinal mediation model. *Health Education & Behavior*, **42**(1), 92–99. doi:10.1177/1090198114537066

Carver, C. S. (2003). Pleasure as a sign you can attend to something else: Placing positive feelings within a general model of affect. *Cognition and Emotion*, **17**, 241–261. doi:10.1080/02699930244000291

Chatzisarantis, N. L., & Hagger, M. S. (2007). Mindfulness and the intention–behavior relationship within the theory of planned behavior. *Personality and Social Psychology Bulletin*, **3**(5), 663–676. doi:10.1177/0146167206297401

Chiaburu, D. S., Oh, I. S., Berry, C. M., Li, N., & Gardner, R. G. (2011). The five-factor model of personality traits and organizational citizenship behaviors: A meta-analysis. *Journal of Applied Psychology*, **96**(6), 1140–1166. doi:10.1037/a0024004

Conner, M., & Godin, G. (2007). Temporal stability of behavioural intention as a moderator of intention–health behaviour relationships. *Psychology & Health*, **22**(8), 875–897. doi:10.1080/14768320601070449

Conner, M., McEachan, R., Jackson, C., McMillan, B., Woolridge, M., & Lawton, R. (2013). Moderating effect of socioeconomic status on the relationship between health cognitions and behaviors. *Annals of Behavioral Medicine*, **46**(1), 19–30. doi:10.1007/s12160-013-9481-y

Conner, M., McEachan, R., Lawton, R., & Gardner, P. (2016). Basis of intentions as a moderator of the intention–health behavior relationship. *Health Psychology*, **35**(3), 219–227. doi:10.1037/hea0000261

Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology*, **21**, 194–201. doi: 10.1037/0278-6133.21.2.194

Conner, M., Rodgers, W., & Murray, T. (2007). Conscientiousness and the intention–behavior relationship: Predicting exercise behavior. *Journal of Sport and Exercise Psychology*, **29**(4), 518.

Conner, M., Sandberg, T., McMillan, B., & Higgins, A. (2006). Role of anticipated regret, intentions and intention stability in adolescent smoking initiation. *British Journal of Health Psychology*, **11**(1), 85–101. doi:10.1348/135910705X40997

Cooke, R., & Sheeran, P. (2004) Moderation of cognition-intention and cognition-behaviour relations: A meta-analysis of properties of variables from the theory of planned behaviour. *British Journal of Social Psychology*, **43**, 159–186. doi:10.1348/0144666041501688

Cooke, R., & Sheeran, P. (2013). Properties of intention: Component structure and consequences for behavior, information processing, and resistance. *Journal of Applied Social Psychology*, **43**(4), 749–760. doi:10.1111/jasp.12003

Corradi, N., Priftis, K., Jacucci, G., & Gamberini, L. (2013). Oops, I forgot the light on! The cognitive mechanisms supporting the execution of energy saving behaviors. *Journal of Economic Psychology*, **34**, 88–96. doi:10.1016/j.joep.2012.11.002

De Bruin, M., Sheeran, P., Kok, G., Hiemstra, A., Prins, J. M., Hospers, H. J., & van Breukelen, G. J. (2012). Self-regulatory processes mediate the intention–behavior relation for adherence and exercise behaviors. *Health Psychology*, **31**(6), 695–703. doi:10.1037/a0027425

De Witt Huberts, J. C., Evers, C., & De Ridder, D. T. D. (2012). License to sin: Self-licensing as a mechanism underlying hedonic consumption. *European Journal of Social Psychology*, **42**(4), 490–496. doi:10.1002/ejsp.861

De Witt Huberts, J. C., Evers, C., & De Ridder, D. T. D. (2014a). "Because I am worth it" A theoretical framework and empirical review of a justification-based account of self-regulation failure. *Personality and Social Psychology Review*, **18**(2), 119–138. doi:10.1177/1088868313507533

De Witt Huberts, J. C., Evers, C., & De Ridder, D. T. D. (2014b). Thinking before sinning: Reasoning processes in hedonic consumption. *Frontiers in Psychology*, **5**, 1268. doi:10.3389/fpsyg.2014.01268

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, **11**, 227–268. doi:10.1207/S15327965PLI1104_01

Dholakia, U. M., & Bagozzi, R. (2006). As time goes by: How goal and implementation intentions influence enactment of short-fuse behaviors. *Journal of Applied Social Psychology*, **33**, 889–922. doi:10.1111/j.1559-1816.2003.tb01930.x

DiBonaventura, M.D., & Chapman, G.B. (2008). The effect of barrier underestimation on weight management and exercise change. *Psychology, Health and Medicine*, **13**(1), 111–122. doi:10.1080/13548500701426711

Doll, J., & Ajzen, I. (1992). Accessibility and stability of predictors in the theory of planned behavior. *Journal of Personality and Social Psychology*, **63**(5), 754–765. doi:10.1037/0022-3514.63.5.754

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. In E. T. Higgins, A. W. Kruglanski, E. T. Higgins, A. W. Kruglanski (Eds.), *Motivational Science: Social and Personality Perspectives* (pp. 394–415). New York, NY, US: Psychology Press.

Eberl, C., Wiers, R. W., Pawelczack, S., Rinck, M., Becker, E. S., & Lindenmeyer, J. (2013). Approach bias modification in alcohol dependence: Do clinical effects replicate and for whom does it work best? *Developmental Cognitive Neuroscience*, **4**, 38–51. doi: 10.1016/j.dcn.2012.11.002

Einstein, G. O., McDaniel, M. A., Williford, C. L., Pagan, J. L., & Dismukes, R. (2003). Forgetting of intentions in demanding situations is rapid. *Journal of Experimental Psychology: Applied*, **9**(3), 147–162. doi:10.1037/1076-898X.9.3.147

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, **72**, 218–232. doi:10.1037/0022-3514.72.1.218

Fife-Schaw, C., Sheeran, P., & Norman, P. (2007). Simulating behaviour change interventions based on the theory of planned behaviour: Impacts on intention and action. *British Journal of Social Psychology*, **46**, 43–68. doi:10.1348/014466605X85906

Fitzsimons, G. M., & Shah, J. Y. (2012). Confusing one instrumental other for another: Goal effects on social categorization. *Psychological Science*, **20**(12), 1468–1472. doi:10.1111/j.1467-9280.2009.02475.x

Friese, M., Hofmann, W., & Wänke, M. (2008). When impulses take over: Moderated predictive validity of explicit and implicit attitude measures in predicting food choice and consumption behaviour. *British Journal of Social Psychology*, **47**(3), 397–419. doi:10.1348/014466607X241540

Fujita, K., & MacGregor, K. E. (2012). Basic goal distinctions. In H. Aarts, A. J. Elliot, H. Aarts, A. J. Elliot (Eds.), *Goal-directed Behavior* (pp. 85–114). New York, NY, US: Psychology Press.

Gailliot, M. T., Baumeister, R. F., DeWall, C. N., Maner, J. K., Plant, E. A., Tice, D. M., & Schmeichel, B. J. (2007). Self-control relies on glucose as a limited energy source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, **92**(2), 325–336. doi:10.1037/0022-3514.92.2.325

Gilbert, S.J., Gollwitzer, P., Cohen, A-L., Oettingen, G., & Burgess, P.W. (2009). Separable brain systems supporting cued versus self-initiated realization of delayed intentions. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, **35**, 905–915. doi:10.1037/a0015535

Godin, G., & Conner, M. (2008). Intention–behavior relationship based on epidemiologic indices: An application to physical activity. *American Journal of Health Promotion*, **22**(3), 180–182. doi: 10.4278/ajhp.22.3.180

Godin, G., Conner, M., & Sheeran, P. (2005). Bridging the intention–behaviour 'gap': The role of moral norm. *British Journal of Social Psychology*, **44**(4), 497–512. doi:10.1348/014466604X17452

Godin, G., Germain, M., Conner, M., Delage, G., & Sheeran, P. (2014). Promoting the return of lapsed blood donors: A seven-arm randomized controlled trial of the question–behavior effect. *Health Psychology*, **33**(7), 646–655. doi:10.1037/a0033505

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, **54**, 493–503. doi:10.1037/0003-066X.54.7.493

Gollwitzer, P. M. (2014). Weakness of the will: Is a quick fix possible? *Motivation And Emotion*, **38**(3), 305–322. doi:10.1007/s11031-014-9416-3

Gollwitzer, P. M., & Moskowitz, G. B. (1996). Goal effects on action and cognition. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social Psychology: Handbook of Basic Principles* (pp. 361–399). New York: Guilford Press.

Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, **38**, 69–120. doi:10.1016/S0065-2601(06)38002-1

Gollwitzer, P. M., & Sheeran, P. (2009). Self-regulation of consumer decision making and behavior: The role of implementation intentions. *Journal of Consumer Psychology*, **19**(4), 593–607. doi:10.1016/j.jcps.2009.08.004

Gollwitzer, P. M., Sheeran, P., Michalski, V., & Seifert, A. E. (2009). When intentions go public: Does social reality widen the intention–behavior gap? *Psychological Science*, **20**(5), 612-618. doi:10.1111/j.1467-9280.2009.02336.x

Gollwitzer, P. M., Sheeran, P., Trötschel, R., & Webb, T. L. (2011). Self-regulation of priming effects on behavior. *Psychological Science*, **22**(7), 901–907. doi:10.1177/0956797611411586

Grant, H., & Gelety, L. (2009). Goal content theories: Why differences in what we are striving for matter. In G. B. Moskowitz, H. Grant, G. B. Moskowitz, H. Grant (Eds.), *The Psychology of Goals* (pp. 77–97). New York, NY, US: Guilford Press.

Hagger, M. S., & Chatzisarantis, N. L. D. (2014). It is premature to regard the ego-depletion effect as "Too Incredible." *Frontiers in Psychology*, **5**, 298.

Hall, P. A., Fong, G. T., Epp, L. J., & Elias, L. J. (2008). Executive function moderates the intention–behavior link for physical activity and dietary behavior. *Psychology and Health*, **23**(3), 309–326. doi:10.1080/14768320701212099

Hallam, G. P., Webb, T. L., Sheeran, P., Miles, E., Wilkinson, I. D., Hunter, M. D., … Farrow, T. D. (2015). The neural correlates of emotion regulation by implementation intentions. *PLoS One*, **10**(3), e0119500. doi:10.1371/journal.pone.0119500.

Harkin, B., Webb, T. L., Chang, B. P., Prestwich, A., Conner, M., Kellar, I., & Sheeran, P. (2016). Does monitoring goal progress promote goal attainment? A meta-analysis of the experimental evidence. *Psychological Bulletin*, **142**(2), 198–229. doi:10.1037/bul0000025

Harper, S. K., Webb, T. L., & Raynor, K. (2013). The effectiveness of mindfulness-based interventions for supporting people with intellectual disabilities: A narrative review. *Behavior Modification*, **37**, 431–453. doi:10.1177/0145445513476085

Henderson, M. D., Gollwitzer, P. M., & Oettingen, G. (2007). Implementation intentions and disengagement from a failing course of action. *Journal of Behavioral Decision Making*, **20**, 81–102. doi:10.1002/bdm.553

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, **52**(12), 1280–1300. doi:10.1037/0003-066X.52.12.1280

Hofmann, W., Baumeister, R. F., Förster, G., & Vohs, K. D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, **102**, 1318–1335. doi:10.1037/a0026545

Hofmann, W., Rauch, W., & Gawronski, B. (2007). And deplete us not into temptation: Automatic attitudes, dietary restraint, and self-regulatory resources as determinants of eating behavior. *Journal of Experimental Social Psychology*, **43**(3), 497–504. doi:10.1016/j.jesp.2006.05.004

Houben, K., Wiers, R. W., & Jansen, A. (2011). Getting a grip on drinking behavior training working memory to reduce alcohol abuse. *Psychological Science*, **22**(7), 968–975. doi:10.1177/0956797611412392

Inzlicht, M., & Berkman, E. (2015). Six questions for the resource model of control (and some answers). Available at SSRN: http://ssrn.com/abstract=2579750. doi: 10.2139/ssrn.2579750

Inzlicht, M., Schmeichel, B. J., & Macrae, C. N. (2014). Why self-control seems (but may not be) limited. *Trends in Cognitive Sciences*, **18**(3), 127–133. doi:10.1016/j.tics.2013.12.009

Johnson, R. E., Chang, C. H., & Lord, R. G. (2006). Moving from cognition to behavior: What the research says. *Psychological Bulletin*, **132**, 381–415. doi:10.1037/0033-2909.132.3.381

Kashima, Y., Gallois, C., & McCamish, M. (1993). The theory of reasoned action and cooperative behaviour: It takes two to use a condom. *British Journal of Social Psychology*, **32**(3), 227–239. doi:10.1111/j.2044-8309.1993.tb00997.xfa

Keer, M., Conner, M., Putte, B., & Neijens, P. (2014). The temporal stability and predictive validity of affect-based and cognition-based intentions. *British Journal of Social Psychology*, **53**(2), 315–327. doi:10.1111/bjso.12034

Kovač, V. B., & Rise, J. (2007). The relation between past behavior, intention, planning, and quitting smoking: The moderating effect of future orientation. *Journal of Applied Biobehavioral Research*, **12**(2), 82–100. doi:10.1111/j.1751-9861.2007.00015.x

Kuhl, J., & Quirin, M. (2011). Seven steps toward freedom and two ways to lose it: Overcoming limitations of intentionality through self-confrontational coping with stress. *Social Psychology*, **42**(1), 74–84. doi: 10.1027/1864-9335/a000045

Lange, F., & Eggert, F. (2014). Sweet delusion. Glucose drinks fail to counteract ego depletion. *Appetite*, **75**, 54–63. doi:10.1016/j.appet.2013.12.020

Liberman, N., & Dar, R. (2009). Normal and pathological consequences of encountering difficulties in monitoring progress towards goals. In Moskowitz, G. B., & Grant, H. (Eds.), *The Psychology of Goals* (pp. 277–303). New York: Guilford Press.

Locke, A. E., & Latham, G. (Eds.). (2013). *New Developments in Goal Setting and Task Performance* (pp. 523–548). New York, NY: Routledge.

Locke, E. A., & Latham, G. P. (1992). 'Process feedback in task groups: An application of goal setting': Comments. *Journal of Applied Behavioral Science*, **28**(1), 42–45. doi:10.1177/0021886392281004

Louro, M. J., Pieters, R., & Zeelenberg, M. (2007). Dynamics of multiple-goal pursuit. *Journal of Personality and Social Psychology*, **93**, 174–193. doi:10.1037/0022-3514.93.2.174

McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the theory of planned behaviour: A meta-analysis. *Health Psychology Review*, **5**(2), 97–144. doi:10.1080/08870446.2011.613995

Michie, S., Whittington, C., Abraham, C., McAteer, J., & Gupta, S. (2009). Effective techniques in healthy eating and physical activity interventions: A meta-regression. *Health Psychology*, **28**, 690–701. doi:10.1037/a0016136

Miles, E., Sheeran, P., Baird, H. M., Macdonald, I., Webb, T. L., & Harris, P. R. (2016). Does self-control improve with practice? Evidence from a 6-week training program. *Journal of Experimental Psychology: General*, **145**(8), 1075–1091. doi:10.1037/xge0000185

Milkman, K. L., Rogers, T., & Bazerman, M. H. (2008). Harnessing our inner angels and demons: What we have learned about want should conflicts and how that knowledge can help us reduce short-sighted decision making. *Perspectives on Psychological Science*, **3**(4), 324–338. doi:10.1111/j.1745-6924.2008.00083.x

Molden, D. C., Hui, C. M., Scholer, A. A., Meier, B. P., Noreen, E. E., D'Agostino, P. R., & Martin, V. (2012). Motivational versus metabolic effects of carbohydrates on self-control. *Psychological Science*, **23**(10), 1137–1144. doi:10.1177/0956797612439069.

Moskowitz, G. B., & Grant, H. (Eds.). (2009). *The Psychology of Goals*. New York: Guilford Press.

Muraven, M. (2010). Building self-control strength: Practicing self-control leads to improved self-control performance. *Journal of Experimental Social Psychology*, **46**, 465–468. doi:10.1016/j.jesp.2009.12.011

Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin*, **126**(2), 247–259. doi:10.1037/0033-2909.126.2.247

Myrseth, K. O. R., & Fishbach, A. (2009). Self-control: A function of knowing when and how to exercise restraint. *Current Directions in Psychological Science*, **18**, 247–252. doi:10.1111/j.1467-8721.2009.01645.x

Nordgren, L. F., van der Pligt, J., & van Harreveld, F. (2008). The instability of health cognitions: Visceral states influence self-efficacy and related health beliefs. *Health Psychology*, **27**, 722–727. doi:10.1037/0278-6133.27.6.722

O'Carroll, R. E., Chambers, J. A., Dennis, M., Sudlow, C., & Johnston, M. (2014). Improving medication adherence in stroke survivors: Mediators and moderators of treatment effects. *Health Psychology*, **33**(10), 1241–1250. doi:10.1037/hea0000082

O'Carroll, R. E., Chambers, J.A., Dennis, M., Sudlow, C., Johnston, M. (2013). Improving adherence to medication in stroke survivors: A pilot randomised controlled trial. *Annals of Behavioral Medicine*, **46**, 358–368. doi:10.1007/s12160-013-9515-5

Orbell, S., & Hagger, M. (2006). "When no means no": can reactance augment the theory of planned behavior? *Health Psychology*, **25**(5), 586–594. doi:10.1037/0278-6133.25.5.586

Orbell, S., & Sheeran, P. (1998). 'Inclined abstainers': A problem for predicting health-related behaviour. *British Journal of Social Psychology*, **37**(2), 151–165. doi:10.1111/j.2044-8309.1998.tb01162.x

Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin*, **124**(1), 54–74. doi:10.1037/0033-2909.124.1.54

Papies, E. K., Pronk, T. M., Keesman, M., & Barsalou, L. W. (2014). The benefits of simply observing: Mindful attention modulates the link between motivation and behavior. *Journal of Personality and Social Psychology*, **108**(1), 148–170. doi:10.1037/a0038032

Parks-Stamm, E. J., Gollwitzer, P. M., & Oettingen, G. (2010). Implementation intentions and test anxiety: Shielding academic performance from distraction. *Learning and Individual Differences*, **20**(1), 30–33. doi:10.1016/j.lindif.2009.09.001

Parks-Stamm, E., Gollwitzer, P. M., & Oettingen, G. (2007). Action control by implementation intentions: Effective cue detection and efficient response initiation. *Social Cognition*, **25**, 248–266. doi:10.1521/soco.2007.25.2.248

Poropat, A. E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, **135**, 322–338. doi:10.1037/a0014996

Rhodes, R. E., & de Bruijn, G. (2013). How big is the physical activity intention–behaviour gap? A meta-analysis using the action control framework. *British Journal of Health Psychology*, **18**(2), 296–309. doi:10.1111/bjhp.12032

Rhodes, R. E., & Dickau, L. (2012). Experimental evidence for the intention–behavior relationship in the physical activity domain: A meta-analysis. *Health Psychology*, **31**(6), 724–727. doi:10.1037/a0027290

Rhodes, R. E., & Smith, N. E. I. (2006). Personality correlates of physical activity: A review and meta-analysis. *British Journal of Sports Medicine*, **40**(12), 958–965. doi: 10.1136/bjsm.2006.028860

Rivis, A., & Sheeran, P. (2013). Automatic risk behavior: Direct effects of binge drinker stereotypes on drinking behavior. *Health Psychology*, **32**(5), 571–580. doi:10.1037/a0029859

Rogers, R. W. (1983). Preventive health psychology: An interface of social and clinical psychology. *Journal of Social and Clinical Psychology*, **1**(2), 120–127. doi:10.1521/jscp.1983.1.2.120

Rothman, A.J., Gollwitzer, P. M., Grant, A. M., Neal, D. T., Sheeran, P., & Wood, W. (2015). Hale and hearty: How psychological science can create and maintain healthy habits. *Perspectives on Psychological Science*, **10**(6), 701–705. doi:10.1177/1745691615598515

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, **55**(1), 68–78. doi:10.1037/0003-066X.55.1.68

Shah, J. Y., & Gardner, W. L. (Eds.). (2008). *Handbook of Motivation Science*. New York: Guilford Press.

Sheeran, P. (2002). Intention–behaviour relations: A conceptual and empirical review. *European Review of Social Psychology*, **12**, 1–36.

Sheeran, P., & Abraham, C. (2003). Mediator of moderators: Temporal stability of intention and the intention–behavior relationship. *Personality and Social Psychology Bulletin*, **29**, 205–215.

Sheeran, P., Abraham, C., & Orbell, S. (1999). Psychosocial correlates of heterosexual condom use: A meta-analysis. *Psychological Bulletin*, **125**(1), 90–132. doi:10.1037/0033-2909.125.1.90

Sheeran, P., Aubrey, R., & Kellett, S. (2007). Increasing attendance for psychotherapy: Implementation intentions and the self-regulation of attendance-related negative affect. *Journal of Consulting and Clinical Psychology*, **75**, 853–863. doi:10.1037/0022-006X.75.6.853

Sheeran, P., & Orbell, S. (1999). Implementation intentions and repeated behaviour: Augmenting the predictive validity of the theory of planned behaviour. *European Journal of Social Psychology*, **29**(2–3), 349–369. doi:10.1002/(SICI)1099-0992(199903/05)29:2/3<349::AID-EJSP931>3.0.CO;2-Y

Sheeran, P., Godin, G., Conner, M., & Germain, G. (in press). Paradoxical effects of experience: Past behavior both strengthens and weakens the intention–behavior relationship. *Journal of the Association for Consumer Behavior*.

Sheeran, P., Harris, P. R., & Epton, T. (2014). Does heightening risk appraisals change people's intentions and behavior? A meta-analysis of experimental studies. *Psychological Bulletin*, **140**(2), 511–543. http://doi.org/10.1037/a0033065

Sheeran, P., Klein, W. M. P., & Rothman, A. J. (in press). Health behaviour change: Moving from observation to intervention. *Annual Review of Psychology*.

Sheeran, P., & Orbell, S. (2000). Self-schemas and the theory of planned behaviour. *European Journal of Social Psychology*, **30**(4), 533–550.

Sheeran, P., Trafimow, D., & Armitage, C. J. (2003). Predicting behavior from perceived behavioural control: Tests of the accuracy assumption of the theory of planned behaviour. *British Journal of Social Psychology*, **42**, 393–410. doi:10.1348/014466603322438224

Sherman, D. K., Gangi, C., & White, M. L. (2010). Embodied cognition and health persuasion: Facilitating intention–behavior consistency via motor manipulations. *Journal of Experimental Social Psychology*, **46**(2), 461–464. doi:10.1016/j.jesp.2009.12.008

Shipstead, Z., Redick, T. S., & Engle, R. W. (2012). Is working memory training effective? *Psychological Bulletin*, **138**(4), 628–654. doi:10.1037/a0027473

Sirois, F. M. (2004). Procrastination and intentions to perform health behaviors: The role of self-efficacy and the consideration of future consequences. *Personality and Individual Differences*, **37**(1), 115–128. doi:10.1016/j.paid.2003.08.005

Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, **133**(1), 65–94. doi:10.1037/0033-2909.133.1.65

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, **8**(3), 220–247. doi:10.1207/s15327957pspr0803_1

Taylor, C., Webb, T. L., & Sheeran, P. (2014). 'I deserve a treat!': Justifications for indulgence undermine the translation of intentions into action. *British Journal of Social Psychology*, **53**(3), 501–520. doi:10.1111/bjso.12043

Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In H. E. Howe, Jr. & M. Page (Eds.), *Nebraska Symposium on Motivation* (Vol. **27**, pp. 195–259). Lincoln: University of Nebraska Press.

Turchik, J. A., & Gidycz, C. A. (2012). Exploring the intention–behavior relationship in the prediction of sexual risk behaviors: Can it be strengthened? *Journal of Sex Research*, **49**, 50–60. doi:10.1080/00224499.2011.578220

van Empelen, P., & Kok, G. (2008). Action-specific cognitions of planned and preparatory behaviors of condom use among Dutch adolescents. *Archives of Sexual Behavior*, **37**(4), 626–640. doi:10.1007/s10508-007-9286-9

Van Koningsbruggen, G. M., Veling, H., Stroebe, W., & Aarts, H. (2014). Comparing two psychological interventions in reducing impulsive processes of eating behaviour: Effects on self-selected portion size. *British Journal of Health Psychology*, **19**(4), 767–782. doi:10.1111/bjhp.12075

Varley, R., Webb, T. L., & Sheeran, P. (2011). Making self-help more helpful: A randomized controlled trial of the impact of augmenting self-help materials with implementation intentions on promoting the effective self-management of anxiety symptoms. *Journal of Consulting and Clinical Psychology*, **79**(1), 123–128. doi:10.1037/a0021889

Veling, H., van Koningsbruggen, G. M., Aarts, H., & Stroebe, W. (2014). Targeting impulsive processes of eating behavior via the internet. Effects on body weight. *Appetite*, **78**, 102–109. doi:10.1016/j.appet.2014.03.014

Verplanken, B., & Aarts, H. (1999). Habit, attitude, and planned behaviour: Is habit an empty construct or an interesting case of goal-directed automaticity? *European Review of Social Psychology*, **10**(1), 101–134.

Vohs, K. D., & Baumeister, R. F. (Eds.). (2016). *Handbook of Self-Regulation: Research, Theory, and Applications* (3rd ed.). New York: Guilford Press.

von Bastian, C. C., & Oberauer, K. (2014). Effects and mechanisms of working memory training: A review. *Psychological Research*, **78**(6), 803–820. doi:10.1007/s00426-013-0524-6

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**(1), 143–186. http://doi.org/10.1080/10463283.2012.718134

Webb, T. L., & Sheeran, P. (2004). Identifying good opportunities to act: Implementation intentions and cue discrimination. *European Journal of Social Psychology*, **34**, 407–419. doi:10.1002/ejsp.205

Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, **132**, 249–268. doi:10.1037/0033-2909.132.2.249

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.

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**(3), 373–395. doi:10.1348/014466607X267010

Webb, T. L., Sheeran, P., & Pepper, J. (2012). Gaining control over responses to implicit attitude tests: Implementation intentions engender fast responses on attitude-incongruent trials. *British Journal of Social Psychology*, **51**(1), 13–32. 10.1348/014466610X532192

Webb, T. L., Benn, Y., & Chang, B. P. I. (2014). Antecedents and consequences of monitoring domestic electricity consumption. *Journal of Environmental Psychology*, **40**, 228–238. doi:10.1016/j.jenvp.2014.07.001

Webb, T. L., Chang, B. I., & Benn, Y. (2013). 'The ostrich problem': Motivated avoidance or rejection of information about goal progress. *Social and Personality Psychology Compass*, **7**(11), 794–807. doi:10.1111/spc3.12071

Webb, T. L., Gallo, I. S., 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**(1), 143–186. doi:10.1080/10463283.2012.718134

Webb, T. L., Ononaiye, M. S. P., Sheeran, P., Reidy, J. G., & Lavda, A. (2010). Using implementation intentions to overcome the effects of social anxiety on attention and appraisals of performance. *Personality and Social Psychology Bulletin*, **36**, 612–627. doi:10.1177/0146167210367785

Webb, T. L., Sheeran, P., & Luszczynska, A. (2010). Planning to break unwanted habits: Habit strength moderates implementation intention effects on behaviour change. *British Journal of Social Psychology*, **48**(3), 507–523. doi:10.1348/014466608X370591

Wieber, F., & Gollwitzer, P. M. (2010). Overcoming procrastination through planning. In C. Andreou & M. D. White (Eds.), *The Thief of Time: Philosophical Essays on Procrastination* (pp. 185–205). New York: Oxford University Press.

Wieber, F., Gollwitzer, P. M., & Sheeran, P. (2014). Strategic regulation of mimicry effects by implementation intentions. *Journal of Experimental Social Psychology*, **5**, 331–39. doi:10.1016/j.jesp.2014.02.002

Wieber, F., von Suchodoletz, A., Heikamp, T., Trommsdorff, G., & Gollwitzer, P. M. (2015). If-then planning helps school-aged children to ignore attractive distractions. *Social Psychology*, **42**(1), 39–47. doi:10.1027/1864-9335/a000041

Wilkowski, B. M., & Ferguson, E. L. (2016). The steps that can take us miles: Examining the short-term dynamics of long-term daily goal pursuit. *Journal of Experimental Psychology: General*. doi: 10.1037/xge0000150

Witkiewitz, K., Bowen, S., Douglas, H., & Hsu, S. H. (2013). Mindfulness-based relapse prevention for substance craving. *Addictive Behaviors*, **38**(2), 1563–1571. doi:10.1016/j.addbeh.2012.04.001

Wong, C. L., & Mullan, B. A. (2009). Predicting breakfast consumption: An application of the theory of planned behaviour and the investigation of past behaviour and executive function. *British Journal of Health Psychology*, **14**(3), 489–504. doi:10.1348/135910708X360719

Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review*, **114**(4), 843–863. doi:10.1037/0033-295X.114.4.843

Zhang, Y., & Fishbach, A. (2010). Counteracting obstacles with optimistic predictions. *Journal of Experimental Psychology: General*, **139**, 16–31. doi:10.1037/a0018143

Zogg, J. B., Woods, S. P., Sauceda, J. A., Wiebe, J. S., & Simoni, J. M. (2012). The role of prospective memory in medication adherence: A review of an emerging literature. *Journal of Behavioral Medicine*, **35**(1), 47–62. doi:10.1007/s10865-011-9341-9