

**The best-laid plans? New perspectives on planning and implementation intentions**

**by**

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*“Every new beginning comes from some other beginning’s end.”*

-Semisonic, “Closing Time”

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## **ABSTRACT**

Consumers frequently experience difficulty regulating behavior to achieve goals like eating well, exercising, and saving money. Research has shown that implementation intentions – plans connecting situational cues and desired behaviors – are a useful tool to bridge the gap between one’s intentions and actions. However, recent work has also revealed that plans sometimes have null or deleterious effects, reducing goal achievement and possibly misallocating resources spent on pursuing ineffectual plans. Thus, it is important to understand the psychological processes and contexts that contribute to helpful (and not-so-helpful) plans.

In Chapter 1, I investigate processes that drive the effects of planning over time. I approach this question in two ways. First, the existing literature employs many ways of eliciting plans, yet relatively little work has examined how these may be the same or different from when individuals do not set plans. I show that how a plan is elicited changes the means which are focused upon: i.e., facilitative steps to reach a goal versus thinking about coping with obstacles. Second, I unpack a seemingly null X-Y effect of planning to reveal that changes in plan format influence intentions and action through indirect processes. In two field contexts, I demonstrate that if-then plans focused on obstacle-coping facilitate negative performance evaluations, producing changes in regret, outcome expectancies, and future performance. Experience further moderates the link between regret and outcome expectancies.

In Chapter 2, I study how planning influences forecasts. Planning and prediction are closely related; both involve trying to anticipate the presence and impact of future events. However, people frequently exhibit optimistic biases in their forecasts because they form them

by constructing narratives of the future that do not consider barriers. Thus, do plans which encourage elaboration of ways to cope with obstacles change forecasts? To answer this question, I examine three types of predictions – future situations/actions, task durations, and anticipated emotions, and find mixed results for these contexts.

Together, these findings contribute to our understanding of the mechanisms that drive planning and lead to the generation of theoretical and practical recommendations to improve the consistency and reliability of planning for consumers.

## **CHAPTER 1: PLAN TYPES AND PROCESSES UNDERLYING PLANNING OVER TIME**

### **INTRODUCTION**

Consumers often struggle with how to translate their decisions into consistent and sustained action – ask nearly anyone who has made a New Year’s resolution to get to the gym, eat fewer sweets, save for a rainy day, or kick a smoking habit. Advertisers, real estate agents and salespeople are also acutely aware of the maddening difficulties posed by consumers who fully intend to buy but procrastinate, forget, or get distracted before the deal is done.

These failures to implement decisions have substantial economic and consumer welfare consequences. Two-thirds of Americans report that they try to control their weight through dieting, but only 20% are able to keep the pounds off, fueling an obesity epidemic that costs the United States an estimated \$147 billion per year in medical costs (Finkelstein et al. 2009; Loyola University Health System 2013). Over half of Americans in a recent survey reported that they are not confident that they will have saved enough money to retire comfortably, with one-third expecting that they will need to work into their eighties (Wells Fargo & Company 2012). Although many smokers express a desire to quit, only one-third actually attempt to do so each year, and 75-80% of those who try relapse within 6 months (Zhou et al. 2009). In these and many other contexts, turning intentions into long-term actions has the potential to make consumers happier and healthier, and companies – consider firms like Weight Watchers whose business model is built on fostering self-regulation – wealthier.

Implementation intentions – simple plans that bridge the gap between intentions and action – have been proposed as an effective way for consumers to more successfully regulate their behavior (Bagozzi and Dholakia 1999; Gollwitzer 1999; Gollwitzer and Sheeran 2009). Implementation intentions specify the means for an individual to pursue a goal. For instance, a set of implementation intentions for a goal to visit the gym might include laying out a specific time to work out such as when one leaves the office in the evening, or outlining obstacles that need to be overcome, such as forgetting to bring workout gear.

Many studies have demonstrated that implementation intentions improve the likelihood of goal achievement in a wide variety of settings by increasing the cognitive accessibility of anticipated goal-consistent situations and linking those situations to pre-deliberated actions. Thus, implementation intentions help individuals to be better at recognizing times when they should act, and prompt more immediate action by eliminating the need to deliberate “in the moment” over what to do (for a comprehensive review of the construct, see Gollwitzer 1999). A recent meta-analysis of 94 studies yielded a medium-to-large effect size in domains ranging from simple reaction time studies in the lab to field inquiries designed to increase cancer screenings and self-examinations (Gollwitzer and Sheeran 2006). Indeed, at first glance, implementation intentions seem to represent an easy-to-use and consistent way to help consumers translate their best intentions to regulate consumption, saving, and spending into positive results.

Yet, recent work has revealed a more complex story behind these simple plans; sometimes implementation intentions can have no effect or can even backfire, making goal achievement *less* likely. In a large field study of exercise behavior, Skår et al. (2011) found no beneficial effects of implementation intentions on self-reported physical activity or observed attendance at campus sports facilities. Townsend and Liu (2012) discovered that setting

implementation intentions can prompt goal disengagement when individuals are far from achieving their goals, because making a plan makes the difficult road ahead more concrete, causing a general sense of emotional distress. Similarly, when individuals are focused on multiple goals rather than just a single objective, having a concrete plan highlights the difficulty of balancing competing priorities and carrying out all the necessary activities to do so (Dalton and Spiller 2012). Finally, when planners are in a concrete mindset (versus in an abstract one), plans reduce the likelihood that individuals will take advantage of goal-consistent actions that fall outside of their plans (Bayuk, Janiszewski, and Leboeuf 2010). These findings and others (see also Soman and Cheema 2004; Ülkümen and Cheema 2011) suggest that plans might best be approached with caution, particularly in complex “real world” situations outside the lab where people must contend with multiple, competing goals and numerous obstacles that arise over time. Yet, these complex situations are often exactly the types of circumstances that matter a great deal to solving problems that worry consumer behavior researchers and marketing practitioners.

Thus, while implementation intentions seem to represent a promising tool for consumers to better regulate their behavior (and for smart marketers to help them to do it), both academic theory and marketing practice would benefit from a deeper understanding of factors that can drive plans to succeed or fail. Revealing processes that undermine efforts to use implementation intentions should allow for more consistent uses of planning in a wider variety of settings, and foster more optimal use of resources like time and money that might otherwise be squandered on ineffective plans. In this paper, we make two contributions designed to add to this understanding.

First, the planning literature has grouped many varied types of interventions under the umbrella of “implementation intentions,” but relatively little work has examined whether changing the ways in which individuals form plans also changes their content and downstream

effects. We demonstrate that planning techniques are not interchangeable. Asking participants to form plans using two commonly-used prompts – “if-then plans” and “when-where-how” plans – leads them to differentially focus on coping plans to overcome obstacles or step plans to detail facilitative actions to get from “point A to point B.” Thus, how we ask the question matters – different ways of planning yield considerations about means to approach the goal.

Second, we examine whether these differences in thought content give rise to psychological processes that can contribute to a better understanding of why plans are sometimes effective and sometimes ineffective. In two field studies with real, consequential goals, we contrast coping-focused and step-focused interventions against a no-plan control condition. We show that coping plans give rise to an indirect mediating process that makes individuals more likely to perceive deficiencies in their actions during goal pursuit; this change in action monitoring leads them to reduce their perceptions of overall performance and feel corresponding regret. Further, the effect of regret changes depending on whether the individual has more or less experience with the goal – with experience, regret can help people to get back on track but for novices it leads planners to judge that future success at the goal is less likely, yielding a subsequent reduction in goal-consistent behavior. This indirect process works in opposition to other concurrent processes, weakening the total impact of setting plans.

In this paper, we will first review the literature on planning and implementation intentions. Second, Study 1 will demonstrate that changes in the way that individuals are asked to plan influences the means that they consider to pursue the goal. In Studies 2 and 3, we connect those changes in content to downstream action. Study 2 is a field experiment that reveals an indirect process linking plan content, evaluation of past actions, regret, outcome expectancies, and future behavior. Study 3 expands this process over a 6-week field observation period, and

demonstrates the role of goal experience as a moderator (see FIGURE 1.1). Together, these findings reveal a new process underlying the link between implementation intentions and action, and provide valuable perspective on why sometimes plans help or hinder goal pursuit.

---INSERT FIGURE 1.1 ABOUT HERE---



## THEORETICAL BACKGROUND

### *The relationship between goals and plans*

As a first step, it is useful to situate where plans fit within the broader context of goal systems. Goal setting and goal striving are typically conceived of as two separate but hierarchically related processes (Carver and Scheier 1982, 1990; Bagozzi and Dholakia 1999; Gollwitzer 1999). Goal setting encompasses how individuals identify needs, form intentions, and commit to achieving desired end-states. For example, imagine an out-of-shape student who notices that they are continually short of breath when climbing the stairs, stimulating a desire to exercise more frequently and a goal intention as an expression of a commitment to start visiting the gym on a regular basis (“This is the year I will start working out!”) Indeed, marketers often try to influence such intentions with sales and advertising communications – an advertisement that prompts a consumer to think, “Yes, it’s time for me to buy a new car this year!” and thus express the intention to make that purchase operates at this level.

After an individual has formed the intention to pursue a goal, the next step is to determine how he or she will strive toward it. To do so, people may form plans, which are often referred to as implementation intentions.<sup>1</sup> Plans define means or actions that will help propel the individual toward the desired end state. Thus, they serve to support goal intentions by defining *how* action is intended to occur, bridging the gap between the intended end state and what actions are actually carried out in support of that objective. For example, our prospective exerciser may set plans to go to the gym three times per week on his way home from the office, or to call a friend

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<sup>1</sup> Both “planning” and “implementation intentions” have been used with varying frequency in the literature with similar intent; for brevity, in this paper I will use the term “plan” and “planning” to also mean “implementation intentions.” By “means,” I refer to actions or strategies that individuals take in support of their goals.

for advice when physical exhaustion sets in and one more step on the treadmill feels like one too many.

Following planning, individuals carry out action in support of their goals, monitoring their actions and adjusting their behaviors as necessary to move toward desired end states and away from undesired ones. This monitoring information generates affect and is used to determine whether action in support of the goal should continue, whether efforts should be reduced, or whether the goal should be abandoned (Carver and Scheier 1982, 1990; Bagozzi and Dholakia 1999). If our gym-going student has been successful at maintaining attendance on the treadmill, he should feel positive emotion and perceive progress, serving as a signal that goal pursuit should continue, but if his efforts have been unsuccessful, he will likely feel negative emotions and adjust by redoubling his efforts or by concluding, “Well, maybe this gym stuff isn’t for me.” Of course, the emotional response that is felt is rooted in one’s appraisal of the situation, which is sometimes independent of objective progress. While successfully progressing toward the goal will most likely lead to positive emotions, one can also think, “I could have done more,” prompting a negative emotional experience. Similarly, even with insufficient progress, one may conclude, “Well, I did make *some* progress...it’s a start,” and feel positively.

The two examples discussed above also highlight that people can make plans for different reasons. Consider that a plan to go to the gym three times per week on the way home from the office details means to propel the individual toward the goal – to take steps to get “from start to finish.” In contrast, a plan to call a friend for advice when one’s energy starts to wane outlines a strategy for how to cope with an obstacle that hinders the ability to achieve the goal.

This distinction between planning for how to facilitate steps (which we will call “step plans”) and planning for how to cope with obstacles (which we will call “coping plans”) largely mirrors

a division in the health psychology literature that is often not mentioned in the broader literature on implementation intentions. Sniehotta and his colleagues (e.g. Sniehotta et al. 2005; Sniehotta, Scholz, and Schwarzer 2006; Araújo-Soares, McIntyre, and Sniehotta 2009) argue that these two types of plans (which they call “action planning” and “coping planning”) represent separate but related constructs that differ in content but that are underlaid by similar perceptual, attentional, and mnemonic processes.<sup>2</sup> Sniehotta et al. (2005) argue that step plans are primary – defining and simulating actions to proceed toward the goal is relatively straightforward – but that forming coping plans requires some experience with the task, as predicting environmental barriers and one’s reaction to them is more difficult if knowledge with the task is low. This pattern of relative primacy of steps and neglect of obstacles is similarly found in the literature on the planning fallacy, which describes how people estimate the amount of time that it will take to complete an action. When forecasting how an action will unfold, people take an “inside view” and construct a personal narrative of the steps they expect to take to reach the goal, while neglecting to consider problems and base rates of success that would be accomplished by adopting a more “outside view.” As a result, their predictions for task completion time tend to be overly optimistic compared to reality, because they do not consider that things may go awry (Kahneman and Lovallo 1993; Buehler, Griffin, and Ross 1994; Buehler, Griffin, and Peetz 2010; Dunning 2007). For example, when asked to forecast their completion time for an upcoming academic

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<sup>2</sup> We have chosen to label “action plans” as “step plans” because plans to cope with obstacles also involve taking action. For the remainder of the paper, we will use the labels “step plans” and “action plans.” We further note that Sniehotta et al (2005) also restrict their consideration of the situational component of a coping plan to reflect only an individual’s internal reaction to a barrier (e.g. feeling tempted to skip a running trip because of fatigue) and not the presence of an environmental obstacle in-and-of itself (e.g. running is hindered because the gym is closed or it is raining outside). We see the primary distinction between these two types of plans as considering proactive means to facilitate progress toward the goal versus considering how to overcome problems and we do not perceive a change in the logic when removing this restriction, so we do not employ it in our conceptualization of coping plans. In our use of the word “step” we mean to distinguish facilitative actions from strategies to cope with obstacles. We do not intend to imply that these plans necessarily induce people to lay out a series of actions in sequence.

project and to describe their process using a speak-aloud protocol, students overwhelmingly focused their attention on steps to reach the goal (71% of thoughts; e.g. “I plan to go to my parents’ place and use their personal computer to type it up today”). Only 3% of thoughts involved problems or barriers to goal achievement (e.g. “I don’t know, it might take a bit longer because I’m not quite caught up in this”; Buehler et al. 1994) Interestingly, forming plans for when, where, and how action should occur increases this tendency to focus on a constructed and seemingly straightforward narrative from the start to the finish of goal pursuit (Buehler and Griffin 2003).

Thus, in the broader picture of goal pursuit, plans support goal intentions by detailing the means by which an individual intends to reach an end state. As people pursue their goals, they monitor their progress, feel resulting emotion, and adjust their future intentions and actions. People can make plans to execute steps to propel them from the start of goal pursuit to the finish (e.g. going to the gym 3 times per week on the way home from work) or for how to cope with obstacles (e.g. calling a friend when experiencing fatigue). The natural tendency seems to be to consider steps; considering how to cope with obstacles does not happen spontaneously and is more likely to arise after obtaining experience with the task.

#### *Processes underlying the functions of plans*

As anyone who has set a New Year’s resolution knows, it is often difficult to move from goal intentions (“This is the year I will start working out!”) into actual actions (feet on the treadmill). Simply “muddling through” often leaves individuals susceptible to problems with getting started, becoming distracted, and failing to discontinue goal pursuit when necessary. Plans attempt to bridge this intention-behavior gap by linking together situations that are likely to

happen during goal pursuit with pre-deliberated actions (Gollwitzer 1999). A number of studies have examined the cognitive processes that work together to form this bridge.

First, consider the situational component of a plan. By thinking about when and where the individual intends to carry out goal-consistent action, it establishes this situation as a behavioral cue. Upon encountering the cued situation, a planner is more likely to recognize and remember it as a time when goal-consistent action is intended. Second, planners are more likely to act efficiently because deliberation “in the moment” about what action to take is not necessary (Gollwitzer 1999). Past research has demonstrated that all of these processes – cue detection, memory, and efficient action initiation – work together to make goal achievement more likely (Parks-Stamm, Gollwitzer, and Oettingen 2007; Achtziger, Gollwitzer, and Sheeran 2008). To continue the example of working out, it should be easier for our exerciser to recognize situations when fatigue is starting, and when this cue is detected, it should take minimal thought and effort to reach for phone to call one’s friend for advice.

Planning interventions have taken many forms in the existing literature, but how these forms are alike and different is not well understood (Hagger and Luszczynska 2014; but see Oettingen, Hönig, and Gollwitzer 2000; Chapman, Armitage, and Norman 2009). In many cases, these interventions have been assumed to work in similar ways and used interchangeably, sometimes within the same paper. For instance, in the first study of their seminal paper on the effect of implementation intentions, Gollwitzer and Brandstätter (1997) use a planning manipulation taking the form, “When I encounter the situational context y, then I will perform behavior z!” In their second study, the planning task is different - participants are asked to think about a specific time (“e.g. after breakfast the next morning”) and place (“e.g. in a quiet corner in the living room”) to carry out the desired action.

While both of these types of prompts include the same ingredients – both ask planners to think about an action they will carry out and the situation in which that action should occur – they do so in different ways. The first type of plan, which we will refer to as an “if-then” prompt, asks participants to first specify a situational contingency and then match that situation with an action. For example, “If I am feeling tired at the gym, then I will call my friend for advice!” In contrast, the second type of plan, which we will refer to as a “when-where-how” prompt, takes a different focus. When-where-how planners are instructed to think about a goal-consistent action and then to elaborate upon the details for when that action should be executed. For example, a participant might write, “WHAT: Go to the gym, WHEN: At 5:00 pm, WHERE: Gold’s, at the corner of Jones and State, HOW: By stopping in on my way home from work, FOR HOW LONG: I’ll go for an hour.

In sum, plans bridge the gap between goal intentions and the execution by forming associations between situational cues and goal-consistent actions. They do so by making goal pursuit more automatic – plans increase the salience of the situations when action is intended and eliminate the need to deliberate about what to do. Researchers have used varied methods to induce planning; if-then plans ask participants to specify the situational component and match it with a contingent action, and when-where-how plans lay out an action and elaborate upon the situation in which it should be carried out. A critical question is whether this difference in format will translate into changes in the situations and actions that people consider when forming their plans.

#### *Plan structure influences plan focus*

We argue that the structure of these prompts guides planners to be more or less likely to *naturally* consider means that are step-focused or obstacle-focused. When-where-how prompts

lay out a desired action and then elaborate on one of the possible circumstances where could be carried out. This type of thought process mirrors what people do naturally when thinking about goals – as mentioned above, when asked to “think aloud” about reaching an ongoing goal, thoughts about when, where, and how steps will be executed are much more common than thoughts about obstacles, which are rare (Buehler, Griffin, and Ross 1994). Conversely, if-then prompts start by asking participants to first consider a circumstance when they will act, which frames the plan as strict contingent response to a stimulus – action is initiated *if* this stimulus is present. If not, presumably action fails to occur. Thus, people are induced to think reactively. The difference seems akin to a when-where-how planner asking the questions, “So what I am I going to do to pursue this goal? OK, now under what circumstances will I do it?” versus in an if-then plan, “What types of situations do I think will happen as I pursue this goal? OK, now what will do in response?”

Recall from earlier in this discussion that people can make plans to enact steps toward the goal, and they can make plans for how to cope with obstacles. When left to their own devices, they are far more likely to consider steps as opposed to obstacles. However, by placing a planner in a mindset where he or she is induced to think about how they will react if they happen to encounter a situation, it seems likely that obstacles – which require our reaction when they arise – will be more salient. Thus,

**H1: If-then prompts will increase the salience of means to cope with *obstacles*, while when-where-how prompts will lead participants to be more likely to think of *steps*. Further, when participants are not guided in plan formation, they will focus more on steps.**

Note that it is **not** the case that if-then prompts and when-where-how prompts necessarily lead participants to focus exclusively upon obstacle-coping strategies or steps. Both planning prompts can accommodate either type of action. For example, Bayer, Gollwitzer & Achtziger (2010) discuss if-then plans in both ways, citing plans like, "...if I have solved one anagram, then I will immediately start to work on the next!" (step plan), and "If I am getting nervous, then I will try to stay calm!" (coping plan). Rather, we predict that the plan format at hand will guide participants to spontaneously be more likely to consider steps or obstacles accordingly.

Thus, one factor that could explain why plans seem to yield inconsistent results is that researchers and practitioners are referring to a wide variety of interventions as the same and using them in an interchangeable manner when actually they guide thought and action in different ways. Examining these differences in thought content is important because each type of plan is likely to yield different consequences for motivation and perception during goal pursuit, which should influence subsequent cognition and action.

#### *Plan content and the process of goal pursuit over time*

Our second focus in this paper is to examine the processes underlying these plans in goals that mirror many consumption situations like saving money, eating a healthy diet, exercising, etc. – those that are pursued over time, demand ongoing regulation of behavior, and require monitoring of actions to infer performance. A great deal of research has looked at the final outcomes of planning – in other words, whether plans make people more likely to achieve their goals. Often, plans work well (Gollwitzer and Sheeran 2006). However, as detailed above, they sometimes do not work as intended, particularly in complex settings like those characteristic of consumption goals. Part of this uncertainty in the literature may be due to how plans change the underlying process of goal pursuit over time.



In his discussion of plans which are intended to lay out means to progress toward the goal (what we have called action plans) and plans designed to cope with obstacles (coping plans), Sniehotta (2005) speculates that, “Although content and purpose of the planning constructs are different, it is assumed that the mediating perceptual, attentional (e.g. by facilitating the detection of situational cues) and mnemonic processes (e.g. by remembering the cues) are the same” (p. 568). However, to our knowledge, it is unclear at this time whether both step plans and coping plans actually function similarly at the process level. Indeed, in their recent review, Hagger and Luszczynska (2014) call for further research on understanding relationships and differences between the action planning / coping planning constructs commonly used in health psychology and the implementation intentions construct typically found in the social psychology and consumer behavior literatures. It seems reasonable to suggest that if plans work by facilitating the detection of specific situations and removing the need to deliberate about specific corresponding actions (those contained within the plan), underlying process differences may also manifest if the content of those situations and actions changes.

One way that plans might affect the process of goal pursuit over time is by altering the ways in which individuals consider whether or not they have carried out actions in support of the goal. Indeed, such monitoring of behavior is a critical part of goal pursuit – both Control Theory (Carver and Scheier 1982, 1990) and Bagozzi & Dholakia’s model of consumer goal setting and striving (1999) postulate that individuals evaluate their ongoing behavior, asking themselves how well they have executed their intended actions and whether the rate of progress toward the goal is suitable. Armed with this information, individuals feel emotion about their performance and use it to adjust their future actions and commitment to the goal.

We argue that because they can foster inflexibility in detecting situations to act, coping plans disrupt this process, making people more likely to perceive insufficient progress. The result is feelings of regret. For people who are experienced at pursuing the goal at hand, this regret can be motivating, prompting increased expectancies about future performance and behavioral reform. In contrast, regret can be demotivating for novices, causing reduced expectancies about future performance and a resulting decrease in goal-consistent action. We will now detail each of these components in turn.

### *Plans, regulatory focus, and action monitoring*

In order to accurately answer the question, “Have I carried out the actions that I intended to complete in order to pursue this goal?” individuals must be able to consider actions that they have taken, judge their sufficiency, and connect them to the goal at hand. However, this judgment is often open to interpretation; people often misjudge or are biased in their evaluations of performance while pursuing valued goals (Campbell and Warren 2015). If individuals are unable to develop a complete picture of what they have done – for example, because only a subset of actions that were taken are recalled, or because the set of actions was judged to be insufficient - evaluations of progress are likely to be lower.

While plans have been shown to increase cue detection and action efficiency, they also often carry with them a cost in terms of flexibility. The act of setting plans leads individuals to narrow their cognitive focus toward selective, heightened processing of those particular situations and actions, while also creating a closed-mindedness toward information that is incompatible with the chosen means of goal implementation (Gollwitzer and Bayer 1999; see also Bayuk et al. 2010). As a result, accessibility of the situations and actions contained within the plan is enhanced. Yet, real life rarely happens exactly as we expect, particularly when

pursuing effortful goals that require the regulation of many behaviors over time. Unexpected opportunities to enact steps and unforeseen barriers to goal achievement are likely to arise, requiring the individual to act in situations and ways that were unplanned. For instance, recall our earlier example of calling a friend for advice when motivation to work out is low, or going to the gym at 5:00 pm on the way home from work. Other circumstances might arise where those same actions would also be useful – calling a friend when encountering the obstacle of not knowing how to perform a certain exercise, or going to the gym over lunch break, for instance. Unfortunately, past work demonstrates that plans can create perceptual “lock-in,” interfering with the ability to pivot toward goal-consistent but unplanned opportunities to act.

For example, Parks-Stamm and her colleagues (2007) demonstrated how plans reduce flexibility in detecting unplanned chances to act using a listening task. Participants were given the task of listening to a story and typing the first letter of “each and every five-letter word” they heard as quickly as possible. Respondents in the planning condition made a plan to respond to two of these target words – “Laura” and “mouse” – while non-planners made no plan. Making a plan did not help or hinder overall performance – both groups identified the same number of five-letter words – but it did change the types of words that were detected. Participants who formed plans were more likely to recognize the words “Laura” and “mouse,” but their performance at detecting all of the other five-letter words present in the story was worse than participants who had not formed a plan. Thus, the plan helped participants to carry out the specific action that they had anticipated, but hurt their ability to recognize unplanned opportunities to reach the goal.

Similarly, Masicampo and Baumeister (2012) showed participants a series of websites and asked them to form the goal to find a particular piece of information (Bill Murray’s birth

year) during the session. Participants in the planning condition formed a plan to use Wikipedia to find the target information while participants in the control condition simply wrote “Bill Murray’s birth year” repeatedly. When the opportunity to use Wikipedia was made available to participants, having the plan facilitated performance – planners were more likely to find Bill Murray’s birth year than non-planners. However, when the experimenters removed access to the planned opportunity to act, planners were less likely to use an alternate means to achieve the goal (looking up the information on IMDb.com). Follow-up analyses indicated that this deficiency stemmed from planners’ inattention to out-of-plan opportunities – they were less likely to notice that another path to achieve the goal existed.

Thus, while plans often facilitate the detection of planned situations and the execution of corresponding actions, their inflexibility can also hurt the ability to pivot to ways that fall outside the scope of the plan. In turn, when the individual looks back to ask, “How am I doing,” a plan is likely to narrow that window of attention on those circumstances that were planned in advance while failing to account for other actions that were taken but were unplanned.

Further, research on regulatory focus orientation suggests that this inflexibility in monitoring is likely to be particularly impactful for planners who consider obstacles – in other words, for people who form coping plans. Regulatory focus describes a motivational orientation toward goal pursuit. A promotion focus orients individuals toward ideals, a sensitivity to gains / non-gains, and means that are eager and approach-focused. Conversely, a prevention focus places emphasis on oughts, security, sensitivity to losses / non-losses, and means that are vigilant and avoidance-focused (Higgins 1997). Regulatory focus may be either chronic or induced in-the-moment. Indeed, Freitas, Liberman and Higgins (2002) argue that the means contained within plans should function as such a prime, arguing that plans which specify vigilant means to

avoid problems are likely to prime a prevention focus, while plans that invoke eager matches to desired end states should induce a promotion focus. Thus, adopting vigilant coping strategies to overcome obstacles – as we predict will happen in an if-then plan – is likely to induce a prevention-oriented mindset. Similarly, thinking about steps to reach a goal – as we predict for when-where-how planners and control participants – should encourage the adoption of a promotion focus.

Many studies have demonstrated that a prevention focus leads people to process and judge information in a narrower, more restrictive manner that would predict lower evaluations of performance. First, regulatory focus orientation is associated with elaboration style. Specifically, a prevention focus leads to item-specific elaboration – restricting focus to dig deep within a category – while simultaneously reducing the likelihood of engaging in relational elaboration – forging connections between disparate items (Zhu and Meyers-Levy 2007). Zhu and Myers-Levy demonstrate this connection between regulatory focus and cognitive elaboration using both a memory task and an ad evaluation task. Participants in their memory study were exposed to a regulatory focus induction to prime promotion or prevention orientation and then provided a list of 36 words from six categories (e.g. occupations, musical instruments, etc.). After a filler task, participants then engaged in two recall tasks. In a free-recall task, prevention focus led to a reduction in clustering (i.e. recalling consecutive items from the same category, which is an indicator of relational processing) and improved performance on a cued-recall task, which is characteristic of item-specific processing (Hunt and Einstein 1981; Zhu and Meyers-Levy 2007). In a second study, participants were shown advertisements for a camera that featured a headline consistent with either a promotion focus or a prevention focus and that contained thematic elements that were either closely connected to photography (e.g. film, lenses) or distally

connected to photography (e.g. travel, adventure). Because they were prompted to elaborate relationally, promotion-focused participants were able to better integrate and understand ads which contained non-obvious themes, and they also reported greater liking for them. In contrast, prevention-focused participants did not identify a greater number of themes for ads with visuals that went beyond those that were tightly connected to cameras, and they reported greater liking for ads where the connections to photography were plainly evident. As such, people whose planning for obstacles has left them in a prevention focus should be more likely to narrow their focus of recall and elaboration to only that set of actions that closely correspond with the means that were planned, and be less likely to be able to branch out to consider other alternative, unplanned actions that may have also been taken in support of the goal.

Second, prevention focus should also narrow the range of actions that are judged to positively contribute to goal pursuit. To demonstrate that plans reduce the attractiveness of out-of-plan alternatives, Bayuk, Janiszewski, and LeBoeuf (2010) induced promotion or prevention focus and asked participants to form a savings goal. Some participants were also directed to form plans in support of that goal. When participants were oriented toward a prevention focus, forming a plan led to a reduced willingness to take advantage of out-of-plan means to achieve the goal, versus having formed no plan. Conversely, adopting a promotion focus increased the range of acceptable actions to pursue the goal, as planners were more likely to endorse out-of-plan means.

Third, regulatory focus also influences judgments about conjunction and disjunction, which are likely to influence whether people consider the actions that they have taken to be sufficient for success. Brockner and his colleagues (2002) argue that prevention focus leads people to attend to conjunction (the belief that all steps in a series are necessary to satisfy a

condition), while promotion focus is associated with an orientation toward disjunction (the belief that any one step is sufficient to satisfy a condition). This argument is also nicely illustrated by Friedman (1999; as cited in Brockner et al. [2002]), who describes the association between a prevention focus and conjunction as such:

“...consider the goal of securing one’s home from burglars, murderers, and other societal riffraff. Means of attaining this prevention goal include keeping windows and doors locked while asleep or away from home. . . . In prevention, danger (e.g., the prospect of a break-in) can not be averted with certainty unless *all* pathways to danger are effectively overcome” (pp. 25–26; emphasis added to original quotation).

In contrast, a promotion orientation is more strongly associated with the sufficiency of any single path (Friedman 1999; as cited in Brockner et al. [2002]):

“...consider the goal of seeking accomplishment by means of accumulating vast wealth. This promotion goal can be attained in a variety of ways, such as by becoming a successful Wall Street trader, or by winning the state lottery, or . . . Once the individual has successfully pursued one route to this promotion goal (i.e., wealth acquisition) he or she need not pursue alternative routes. . . . *Any* successful route to a promotion goal is a sufficient route” (p. 25; emphasis added to original quotation).

Indeed, Brockner et al. demonstrated that when participants were asked to engage in a judgment task measuring accuracy for conjunctive events (specifically, participants were shown an array of Xs and Os and were asked to estimate the proportion of paths from the top of the array to the bottom that were composed of all Xs), those who reported a greater orientation toward prevention displayed improved accuracy at detecting the proportion of conjunctive paths. Conversely, promotion focus led to the opposite outcome: improved accuracy at judging disjunctive events (the proportion of paths composed of at least one X) thanks to a reduced disjunctive bias. The implication of this finding for planning is that people who are prevention-focused (as we predict for if-then planners) and thus are oriented toward conjunction should be

more likely to be attuned to the perspective that they have to complete each and every action to achieve their goal. Conversely, the disjunctive focus brought on by promotion focus (as we argue should occur for when-where-how planners) should allow individuals to be able to point to a limited number of actions to say, “I’m doing OK.”

Taken together, existing research predicts that when individuals look back and evaluate how they have acted in support of their goal, setting a plan is likely to narrow their focus to the specific actions within that plan. This tendency to focus narrowly on achieving the entire set of these particular actions should be especially powerful for planners focused on obstacle coping. While step plans are likely to facilitate broadening the definition of success to include these alternate possibilities, this is less likely for coping plans.

How does this affect the evaluation of actions taken (or not taken)? In the types of consumption-oriented contexts that we have studied and which require effortful behavior over time (e.g. saving money, exercising, studying, etc.), there are likely to be many routes to success or failure. However, if individuals are focused on a limited set of means, it seems less likely that they will report “doing what needed to be done.” In the event they failed to carry out their planned action, that failure should be immediately apparent and other positive, goal-consistent actions that might compensate are likely to be inhibited by the narrow focus of a coping plan. Conversely, if individuals successfully executed their plan, they are still likely missing the recognition of other complementary actions or windfalls that helped to propel them toward the goal. Thus,



**H2: Setting if-then plans, because they are more strongly focused on coping with obstacles, will reduce evaluations of past performance compared to not setting a plan. When-where-how plans, which are focused on steps, will not differ from not setting a plan.**

*Subsequent effects of planning on the goal pursuit process: Regret, outcome expectancies, future action, and moderation by experience*

Both Control Theory (Carver and Scheier 1982, 1990) and Bagozzi & Dholakia's model of consumer goal setting and striving (1999) postulate that the monitoring processes we have described have multiple outputs – when people monitor their rate of performance toward a goal, they experience changes in emotions, expectancies for future success, and behavior. If past performance has been good, this serves as a signal to the individual that they are on track and should maintain the same course, and leads to positive emotions thanks to a sense of achievement (Carver and Scheier 1982). Conversely, if past performance has been substandard, negative emotions occur, pushing the individual to reform their behavior and try to improve, or reduce their efforts in support of that goal if the perceived likelihood of future success is low (Carver and Scheier 1982; Soman and Cheema 2004).

Regret is the likely emotional outcome when monitoring leads to the recognition of deficient goal progress. Regret arises from counterfactual thought – by pointing to actions that one has taken or failed to take – and it is built upon the realization that the situation would have been better if one had acted differently (Zeelenberg 1999; Zeelenberg and Pieters 2007). Because plans increase the salience of specific actions that the individual intends to perform in service of the goal, regret is more appropriate to examine than disappointment, which is associated with outcomes caused by external forces (Zeelenberg et al. 1998) or guilt, which involves harming others (Zeelenberg and Breugelmans 2008). People can experience regret for a variety of

reasons. Often, they feel regretful over a bad outcome. However, regret can also arise for reasons that are independent of outcome – when there is inconsistency between one’s intentions and actions, or when the process used to arrive at a choice is suboptimal (Connolly and Zeelenberg 2002; Pieters and Zeelenberg 2005). Critically, sometimes regret can be motivating, spurring learning, persistence, and belief in future change, while sometimes it can lead to self-reproach and hopelessness (Inman 2007; Zeelenberg and Pieters 2007).

As a result, regret is likely to influence the ways in which people form expectancies about whether or not they will successfully achieve the goal in the future. One factor that may moderate this influence is the amount of experience that the individual has with the goal. In addition to feelings and judgments about their current rate of progress, people form expectancies by processing multiple sources of information, such as memories of prior outcomes and the ability to conjure up alternate strategies to change behavior. These other pieces of evidence often have a greater influence on the formation of expectancies than information about current performance (Carver and Scheier 1990). However, the availability and richness of these other pieces of evidence are likely to vary widely depending on the individual’s level of goal experience.

People who have pursued the same goal many times before are able to draw upon a wider range of memories when success was at hand or behavioral reform happened; they have more pieces of the puzzle present in order to form a picture of how future goal pursuit will unfold. Thus, feelings about the level of current performance – like regret – are likely to have less negative impact in the formation of a judgment about whether future goal success is possible. While experienced goal-strivers may feel some doubt about the road ahead, those thoughts are likely to be balanced out by remembering instances of past behavior. Indeed, regret often helps

us to remember such past occasions and develop an orientation toward learning and improving for next time (Zeelenberg 1999; Zeelenberg and Pieters 2007). In contrast, novices have fewer past experiences to draw upon, so current feelings should loom large in judging expectations about the future. Without the broader perspective afforded by the ability to remember a variety of past actions and choices, it is easy to judge what will happen in the future by placing all one's focus on feelings and events in the here-and-now. Because experience with the goal is sparse, summary judgments that attribute performance to ability or personality seem more likely. It is easy to imagine a novice dieter saying, "I didn't remember my gym clothes once this week and wow, do I feel bad; maybe this whole health kick isn't for me." For novices, the goal is more likely to be new and uncertain, making it easy to believe that setbacks will be permanent, causing regret to reduce positive and increase negative expectancies for future outcomes.

Finally, expectancies about the likelihood of future success influence what the individual chooses to do next in pursuit of the goal. When future success seems possible, one can respond by continuing to reduce the discrepancy between the current state and the goal. Here regret frequently serves as a "kick in the pants" – the individual knows information from past experiences about the feasibility of achieving the goal, so he or she can push for improved performance on subsequent attempts and try to learn from mistakes (Zeelenberg 1999; Roese and Summerville 2005). However, if feeling regretful has painted a bleak picture of what will happen in the future, the result is often a reduction in effort and goal-consistent action (Carver and Scheier 1990). Thus,

**H3: Reduced evaluations of performance will lead to feelings of regret. Task experience will moderate the effect of regret, leading to reduced outcome expectancies and subsequent future performance for novices but not for more experienced individuals.**

This hypothesis is summarized in FIGURE 1.1.

## **STUDY 1: DOES PLAN FORMAT INFLUENCE PLAN CONTENT?**

Study 1 was intended to demonstrate that the content of implementation intentions is naturally influenced by the ways in which the plan is constructed. Specifically, we examined two commonly-used types of planning interventions – “if-then” and “when-where-how” prompts – that are often used interchangeably. We predicted that forming plans using each of these two methods would spontaneously guide individuals to focus upon different information when considering how to pursue a goal, even when they are not directed to do so by the task instructions. Specifically, we expected participants who formed if-then plans to focus more intently on means to cope with obstacles, and participants who formed when-where-how plans to focus on steps to reach the goal. For comparison, two control conditions for the present analyses were also included: a free-plan condition where participants were simply instructed to make a plan without any further direction, and a “reversed if-then condition.” The latter was intended to demonstrate the role of thought order in the planning process. We expected that participants who were first asked to think about an action and then to elaborate upon the situation in which they planned to execute it would be significantly less likely to form obstacle-coping plans.

### *Participants and Method*

To test the prediction that plan format influences plan content, 281 student participants at a large U.S. university completed a study on finishing their holiday shopping, in a task adapted from Buehler and Griffin (2003). One participant completed the study but did not provide any valid responses, leaving 280 participants available for analysis. Sample size was determined in advance, based on the availability of participants. Participants were randomly assigned to one of the four conditions described above (if-then, when-where-how, reversed if-then, or no-plan control).

The study was run from the middle of November to the beginning of December, at the start of the shopping season for Christmas (December 25, 2014), Hanukkah (December 6-14, 2014), and Kwanzaa (December 26, 2014 – January 1, 2015). Participants listed three people for whom they still needed to buy gifts and were asked how much of their holiday shopping for those people they had left to complete. The majority of participants (92%) had not yet started their holiday shopping, and no participant reported being more than 2/3 finished their shopping.

Participants then proceeded to the planning intervention. As part of the task instructions, we provided participants with two example plans. We took care to ensure these examples were not leading; each set of examples included one step plan and one coping plan, and the order of these was randomly counterbalanced across participants. Examples of each type of plan (which were the same examples presented to participants) may be found in TABLE 1.1.

In all conditions, participants completed four plan statements. The prompts for each condition are shown in APPENDIX 1.1. In the if-then condition, participants were directed to first think about a situation in which they would act, and then a corresponding action. To complete their plans, they filled in blank fields labelled, “IF (fill in a situation),” and, “THEN (fill in an action).” In contrast, participants in the when-where-how condition thought about an action and then a situation, and completed plan statements containing fields for the planned action “WHAT (fill in an action)”, as well as when, where, how, and for how long that action would be carried out. In the if-then-reversed condition, participants were instructed to think about an action and then a situation using blanks marked “ACTION (fill in an action)” and “IF (fill in a situation).” Finally, in the control condition, participants were simply given four blank spaces and were asked to “make a plan” without any guidance on format.

## *Results*

We evaluated the naturalistic content of participants' plans. Two coders who were blind to the study hypotheses categorized respondents' plans as describing a facilitative step or means to cope with an obstacle; they first coded plans independently with substantial interrater reliability (intraclass correlation for proportions = .96) and then resolved as many differences as possible by mutual agreement.

As predicted, the way in which participants' plans were elicited influenced the situations and actions that they considered. We calculated the proportion of each participant's plan statements that were focused on obstacle coping and examined between-condition differences using an ANOVA with planned comparisons. Because the dependent variable is a proportion, we employed an arcsine-root transformation as directed by Sokal and Rohlf (1995).<sup>3</sup> Untransformed means are reported below for interpretability.

When not given guidance on how to form plans in the control condition, participants focused most of their attention on steps, forming plans to cope with obstacles only rarely ( $M_{\text{CONTROL}} = 4.29\%$ ,  $SD = .12$ ). When-where-how planners acted in much the same way, but with a slightly greater propensity to focus on steps ( $M_{\text{WWH}} = 0\%$ ,  $SD = .00$ ;  $F(1,276) = 1.62$ ,  $p = .21$ ). In contrast, if-then planners focused much more intently on coping plans for how to overcome barriers to the goal ( $M_{\text{IT}} = 58.33\%$ ;  $SD = .37$ ), a proportion that was significantly greater than control ( $F(1,276) = 178.90$ ,  $p < .001$ ). As expected, reducing the reactive nature of the plan by considering the goal-consistent situation prior to the action in the if-then reversed condition led

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<sup>3</sup> Analyses using an ANOVA with log transformed DV yielded substantively identical results. Analyses using a generalized linear model with a binomial variance function (including robust standard errors) and log link function as recommended by the UCLA Statistical Consulting Group (n.d.) yielded substantively identical results except the difference in proportions between the when-where-how condition and the free plan control was significant.

to a significant drop in the proportion of obstacles planned for, compared to the if-then condition ( $M_{IT-REV} = 37.15\%$ ,  $SD = .29$ ;  $F(1,276) = 22.35$ ,  $p < .001$ ).

---INSERT FIGURE 1.2 ABOUT HERE---

### *Discussion*

Thus, a clear pattern emerged from the coded ratings of participants' plans across the two analyses. Despite the fact that different plan formats have been used in the literature, it is evident that not all plans are equivalent. The way in which a plan is constructed guides participants to spontaneously think about different situations and actions for goal pursuit.

Specifically, when left to their own devices, individuals rarely consider how to cope with obstacles and instead focus on steps to progress from the start to the finish of the goal. Forming a when-where-how plan also prompts planners to think about steps. However, by prompting individuals to first think about a situation in which they will act and then to deliberate over a contingent action, if-then plans greatly increase the likelihood that coping plans will be formed. Underscoring the importance of thought order in this process, a reversed version of the if-then prompt where the action is decided upon first and then the appropriate situation is elaborated upon ("Action...if") yielded a significant drop in the proportion of coping plans that were formed.

This finding is important because it demonstrates that planning interventions are not interchangeable. This should influence both the information that is attended to during goal pursuit, and in turn, affect the actions that people undertake over time, leading to possible differences in effectiveness and consistency across plan types. In Studies 2 and 3, we expand upon this notion and demonstrate that if-then plans, which induce thoughts about coping with



obstacles, generate processes that influence the subjective experience of goal pursuit, and in turn, the actions that people take.

## **STUDY 2: PURSUING AN ACADEMIC ACHIEVEMENT GOAL**

Study 2 was intended as an initial test of the proposed process model. To maximize external validity and best approximate the impact of this process for real goals that require the effortful regulation of behavior in a manner similar to many consumption and purchase behaviors, we conducted a field experiment in the context of a consequential academic achievement goal.

Studying behavior represents an ideal context for this investigation. Although devoting time to studying is a highly valued objective for the participant population at hand (college students in a selective and competitive undergraduate program), they often experience difficulty achieving this goal. In addition, studying requires maintenance of behavior over time, often in the absence of a direct connection to results (i.e. studying does not guarantee good grades, and there is a delay to performance on an evaluation). In this way, studying maintains many of the same features as other self-control goals like eating healthily, controlling spending, or exercising regularly.

### *Participants and Method*

Undergraduate business students enrolled in an accounting course at a large U.S. university participated in exchange for candy and the chance to win a gift card. Sample size was determined by the number of students enrolled in the course; all students were given the opportunity to volunteer to participate in the experiment.

The focus of the investigation was a self-set study time goal for an upcoming quiz in the course. This study was conducted in three waves. Wave 1 took place one week prior to the quiz, Wave 2 was administered immediately after the quiz, and Wave 3 occurred in the period following the quiz. Participants were assigned by class section to one of four conditions:

Respondents in the if-then action condition read instructions and an example for the planning intervention, generated three obstacles that might impede their study time goal, and then formed three if-then statements specifying a situation when and where they might encounter the obstacle and a corresponding action they would carry out (e.g. “If I am getting tired while I am studying, then I will drink a cup of coffee”). Participants were directed to repeat the statements in their head until they were confident they could remember them. Participants in the when-where-how condition read instructions for the planning intervention, specified actions in support of their goal pursuit, and then when, where, how and for how long they would execute them (e.g. WHAT specific actions will I take to reach my goal: Review my lecture notes, WHEN will I take the actions to reach my goal: Every evening for the next week, WHERE will I take the actions to reach my goal: At the library, HOW will I take the actions to reach my goal: Read through the notes and summarize them, HOW LONG will I take the actions to reach my goal: About an hour a night). Respondents were directed to repeat the statements in their head until they were confident they could remember them. Participants in the control condition pursued their goals naturally without any directions to form plans. Finally, respondents in the if-then inaction followed the same procedure as in the if-then action condition, but specified actions that they would *not* take (e.g. “If I am getting tired while I am studying, then I will not take a nap”). For clarity, we will distinguish between these two types of if-then plans in this study using the labels “if-then action” and “if-then inaction.”

We administered the if-then inaction condition as an attempt to further examine the relationship between plan content and action monitoring. As there exists a number of potential differences between plan formats (e.g. length), the if-then inaction condition allows for a direct manipulation of the monitoring function compared to if-then action plans while keeping other

dimensions constant, allowing us to rule out the influence of those other factors. To weigh the different implications for monitoring between an if-then action and an if-then inaction plan, consider what poor performance on each plan looks like. For an if-then inaction plan, committing an action represents poor follow-through. For example, in the plan, “If I have difficulty understanding a concept while studying, then I will not take a break,” failing is committing the action at hand – taking a break. Conversely, failing to enact an if-then action plan is due to the omission of an action. For example, in the plan, “If I have difficulty understanding a concept while studying, then I will email the instructor,” omitting the action to contact the instructor represents poor plan adherence. Past research on the experience of regret has shown that the effects of these two types of failure are not equal – people try harder to deal with the emotional fallout of commissions through dissonance reduction (Gilovich, Medvec, and Chen 1995), and their memories of commissions remain less active than omissions, often causing rumination and self-recrimination (Savitsky, Medvec, and Gilovich 1997). As a result, individuals cognitively and emotionally deal with and move on from commissions quickly, but the fallout from omissions lingers over time (Gilovich and Medvec 1994). Thus, we predicted that the if-then inaction condition, where poor performance is represented by fast-fading commissions, would be less susceptible to our proposed process through action monitoring, regret, and behavioral change because people should resolve and move on from negative thoughts and feelings about poor performance very soon after they happen. In contrast, omissions, which linger over time, should persist in memory and lead to subsequent regret.

At the start of Wave 1, we asked all participants to create a code word to match their responses over time, and to set an ambitious study time goal for the next week leading up to the quiz. Participants completed a calendar with spaces on each of the subsequent seven days, in

which they filled in their number of intended daily studying hours. Respondents then supported their study time goal with a plan that varied across conditions as described above, and completed measures about their feelings and expectations for the next week of studying. They also received a sheet to track the number of hours that they studied.

One week later, we administered Wave 2 of the study immediately following the quiz. Participants entered the hours that they actually studied for the quiz on a calendar identical to the one where they indicated their goal in Wave 1. This measure of actual study time was followed by a thought listing about how they could have improved upon their past week of studying, measures of participants' study performance, emotional and behavioral reactions to their goal achievement, and intentions for future behavior. The measures used in our model are summarized in APPENDIX 1.2. We also administered a third set of items after participants received grades. These focused mainly on their performance on the quiz and were followed by demographics. Items in Wave 3 did not yield any noteworthy conclusions and are not discussed further.

Two hundred sixty-six participants provided matched responses to Waves 1 and 2 and responded to all items in the serial model described below. However, the data from one section of the course were excluded from analysis because a student made a loud comment disparaging academic research during Wave 1. During data collection, we decided to exclude this section (31 participants) as this student's remarks may have led others to not take the task seriously, leaving 235 respondents available for analysis.<sup>4</sup>

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<sup>4</sup> These analyses were also later conducted using the excluded section. Analysis of the expanded dataset reached the same conclusions, except for the reported number of study hours. With the excluded section included in the dataset, participants in the if-then action condition reported studying for fewer hours versus control ( $F(1,261) = 4.03, p = .046$ .) Conclusions from all other analyses did not differ.

## Results

Across all conditions, the number of hours participants spent studying was relatively constant ( $M_{\text{CTRL}} = 6.01$ ,  $SD_{\text{CTRL}} = 4.16$ ;  $M_{\text{IT-ACT}} = 5.22$ ,  $SD_{\text{IT-ACT}} = 3.28$ ;  $M_{\text{WWH}} = 5.69$ ,  $SD_{\text{WWH}} = 4.20$ ;  $M_{\text{IT-INACT}} = 5.78$ ,  $SD_{\text{IT-INACT}} = 3.82$ ) and an ANOVA with planned contrasts indicated that these differences were not significant compared to control ( $F_{\text{IT-ACT/CTRL}}(1,230) = 1.20$ ,  $p = .28$ ;  $F_{\text{IT-INACT/CTRL}}(1,230) = .10$ ,  $p = .75$ ;  $F_{\text{WWH/CTRL}}(1,230) = .21$ ,  $p = .65$ )<sup>5</sup>. Thus, plans did not change immediate performance, which holds actual goal achievement constant and yields a good test of their effect on monitoring, regret, and subsequent behavior.

From this broader perspective, an interesting finding emerges that is consistent with the hypothesized process model. We ran a serial multiple mediator model (Hayes 2013; Hayes and Preacher 2014), which allows for the estimation of a sequential, mediated path between the independent and dependent variables. Consistent with our hypothesis, participants in the if-then action condition were more likely to report that they coped poorly with obstacles that hindered their studying, compared to the control condition ( $\beta = -.27$ ,  $t(231) = -1.86$ ,  $p = .064$ ; see FIGURE 1.3). This perceived poor performance at obstacle coping was associated with two outcomes. First, as predicted, the worse participants coped with obstacles, the more regret they felt about their performance ( $\beta = -.43$ ,  $t(230) = -6.41$ ,  $p < .001$ ). While feeling regretful did not change participants' outcome expectancies for their likelihood of achieving the goal of studying for the final exam ( $\beta = .09$ ,  $t(229) = 1.47$ ,  $p = .14$ ) their feelings of regret were positively associated with intentions to study for the upcoming final exam ( $\beta = .20$ ,  $t(228) = 3.44$ ,  $p < .001$ ). Second, outcome expectancies also played a role in participants' intentions to engage in future studying goals, but not as a consequence of regret. Instead, judgments of obstacle-coping directly

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<sup>5</sup> These analyses include 234 participants, as one participant failed to report the number of hours studied.

influenced outcome expectancies ( $\beta = .18$ ,  $t(229) = 2.58$ ,  $p = .01$ ). In turn, outcome expectancies also influenced intentions to study for the final exam ( $\beta = .50$ ,  $t(228) = 8.22$ ,  $p < .001$ ). The end result was the presence of two significant, opposing indirect paths. The first path, through action monitoring and regret, led if-then action planners to be more likely to set future study time goals. Bias-corrected bootstrapped confidence intervals (10,000 samples) confirmed that this indirect path through regret was significant for the if-then action condition ( $\beta = .0239$ , Lower CI: .0025, Upper CI: .0686). The second path, through action monitoring and outcome expectancies, led if-then action planners to be less likely to pursue an ambitious study time goal for their final exam. This indirect path was also significant ( $\beta = -.0250$ , Lower CI: -.0834, Upper CI: -.0010).

Some readers may note that the path between setting an if-then action plan and action monitoring was marginal ( $p = .064$ ). The significance of an indirect effect is determined by whether its bootstrapped confidence interval is different from 0, regardless of whether hypothesis tests for constituent paths are significant individually (Hayes 2009, 2013). As 0 is not included in the confidence interval for the if-then action condition, the indirect effect is significant.

The total effect of setting an if-then action plan, observing one's performance, and then deciding how to proceed for a future goal was null for if-then action planners – they were less likely to set ambitious study goals for the final exam ( $M_{IT-ACT} = 1.00$ ,  $SD_{IT-ACT} = 1.71$ ) versus participants in the control condition ( $M_{CTRL} = 1.39$ ,  $SD_{CTRL} = 1.50$ ), but this difference was not significant ( $\beta = -.20$ ,  $t(231) = -1.25$ ,  $p = .21$ ). However, despite this seemingly null effect, by examining the combination of the indirect and direct effects, we reveal valuable information that seems likely to help improve planning interventions. Note that this total X-Y effect is the sum of the direct and indirect effects (Hayes 2013). Here, we uncovered the presence of two indirect effects that oppose each other. The first, through action monitoring and regret, has a positive

influence on if-then planners' likelihood of setting future ambitious study goals. The second, through action monitoring and outcome expectancies, has a negative influence on the same outcome. Taken together, these effects serve to oppose each other, weakening the total X-Y relationship between setting an if-then action plan focused on how to cope with obstacles and intentions to pursue the goal on subsequent opportunities.

In contrast, the link between action monitoring and setting a when-where-how ( $\beta_{\text{WWH}} = -.07, t(231) = -.49, p = .62$ ) or if-then inaction plan ( $\beta_{\text{IT-INACT}} = -.09, t(231) = -.59, p = .56$ ) did not differ from control, causing non-significant indirect effects in these conditions for both regret and outcome expectancies. Confidence intervals for these paths may be found in FIGURE 1.3.

---INSERT FIGURE 1.3 ABOUT HERE---

In addition to the results described above, we also performed supplemental analyses to target the nature of participants' emotional responses. In addition to the amount of regret they felt about their level of goal achievement, participants also reported their regret over the study goal that they set and the plan that they constructed. Substituting these measures into the model in place of the achievement regret item caused the indirect path to be non-significant for the if-then action condition, as neither goal regret nor plan regret were associated with changes in future goal intentions ( $\beta_{\text{INCLUDING GOAL REGRET}} = .0048, \text{LLCI: } -.0008, \text{ULCI: } .0252, \beta_{\text{INCLUDING PLAN REGRET}} = .0024, \text{LLCI: } -.0019, \text{ULCI: } .0160$ )<sup>6</sup>. This pattern indicates that the downstream impact of participants' regret is centered on perceived deficiencies in their performance, and not because they feel that they have set bad goals or bad plans. We also asked participants to consider a set of other emotions in regard to their performance ("When you think about how you

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<sup>6</sup> This analysis includes 234 participants, as one participant did not answer the plan regret item.



studied for this quiz, how do you feel right now?” 0 = “not at all”, 6 = “very much”). We combined the negative emotions ( $\alpha = .93$ ) and positive emotions ( $\alpha = .84$ ) into indices and inserted them in place of regret in the serial model (see APPENDIX 1.3). Negative emotions yielded similar results to performance regret – exerting a positive influence on future intentions, though the path from outcome expectancies to intentions fell short of significance – while positive emotions did not. We chose to focus upon regret as the main focus of our investigation because its characteristics – its counterfactual nature and focus on actions that have been committed (or foregone) by the self – make it the most theoretically appropriate emotion for this setting. However, the experience of other negative emotions, particularly self-conscious feelings such as self-directed anger, disappointment, and guilt, also may hold promise for future investigations.

### *Discussion*

Study 2 yields three important insights. First, in line with the differences in content that were observed in Study 1, plan format matters. Participants who made if-then action plans were more likely to conclude that they had coped less well with obstacles, while we did not observe this effect for when-where-how or if-then inaction participants who set plans that should have allowed them to pivot away from such failings.

A second insight gained from this study is that this change in how if-then action planners evaluated their actions generated two indirect processes leading to regret about performance and to shifts in outcome expectancies. If-then action planners felt more regret, which was motivating – it prompted increased intentions to study hard for the final examination, compared to control participants who set no plan. On the other hand, they also felt less likely to be able to achieve their future goals, leading to decreased intentions to set ambitious study goals for the final exam,

compared to control. Together, these indirect effects worked against each other, causing the appearance of a null effect. However, revealing their presence has much practical and theoretical value, as we outline below.

Consider that the presence of these indirect paths occurred in the absence of a significant direct or total X-Y effect. Methodologists agree that a significant total effect, which consists of the sum of the direct effect and all indirect effects, is not necessary to demonstrate a relationship between the independent variable, a set of mediating variables, and the dependent variable (see Mathieu and Taylor 2006; Hayes 2009, 2013; Zhao, Lynch Jr., and Chen 2010; Rucker et al. 2011 for excellent summaries on the topic). The only criterion to establish the presence of an indirect effect is the significance of the path between the independent variable (in our case, planning), the mediators (action monitoring, regret, and outcome expectancy) and the dependent variable (future intentions to act; Hayes 2009; Zhao et al. 2010). Indeed, the presence of such indirect effects provides fertile ground to uncover additional previously hidden effects which can yield valuable insight into underlying processes (Hayes 2009; Zhao et al. 2010). This highlights the need to take a finer-grained look at the level of psychological processes – measuring only goal achievement or future intentions would have masked these indirect processes which indeed affected the ongoing goal pursuit of individuals who set if-then action plans.

Finally, a third insight gathered from this study concerns the implications for theory and practice. In this context, regret strengthened participants' intentions to continue to pursue the goal. By modifying planning interventions to strengthen the sting of regret, participants may be induced to try harder next time. Further, weakening the link between perceptions of how well one has acted thus far in service of the goal and one's expectations for the future also seems

critical to helping people to keep pushing toward their objectives. We present further detail on strategies that consumers and companies may wish to use in the General Discussion.

While the findings from the academic achievement field study were encouraging, a follow-up investigation is useful for a few reasons. First, we did not have an opportunity to observe subsequent performance after the monitoring period (i.e., how much time did students study for the upcoming final exam?), as the in-class setting provided only limited access to participants. Second, our participant population in this study was relatively homogeneous. Our respondents were students in a selective undergraduate business program; they are all experienced (and successful) at attempting academic goals and attaining positive outcomes. A sample with a greater diversity of experience would allow us to examine the impact of this variable on the planning process. Finally, we sought to generalize our findings to a different type of goal that is also relevant to consumer self-regulation – maintaining a physical fitness goal.

### **STUDY 3: PURSUING A PHYSICAL FITNESS GOAL**

In Study 3, we tested the process uncovered in Study 2 in a different self-regulatory domain: exercise behavior. Exercising regularly is another goal that people frequently intend to achieve – U.S. consumers were projected to spend over \$81 million in 2014 on the tools of the trade (IBISWorld 2014) – but one where success is often elusive and short-lived. The context for this study was a six-week physical fitness program, providing insight into the mechanisms driving the effect of plans over time in a setting with excellent external validity. Further, we capitalized upon the diversity of the available participant pool to test the moderating role of task experience.

#### *Participants and Method*

Respondents were recruited from “Exercise!” (“E!”; program name disguised for confidentiality), a fitness promotion program at a large U.S. university, in exchange for the chance to win a gift card. E! is a 6-week program available to all University faculty, staff, and students. Participants set physical activity goals and recorded their weekly exercise minutes using an online tracker. Recruiting for this study occurred via an email invitation to all University-affiliated E! members containing a link to the study, and any member who received the email could participate. We analyzed a subset of participants according to the following criteria.

First, because there was a large degree of variability in the exercise minutes reported by participants who clicked the link in the study invitation (as one would expect in a self-guided exercise program in a population with a diverse commitment and ability to exercise), to reduce the impact of outliers we Winsorized the exercise minute distributions for each of the four weeks of interest (baseline, Week 3, Week 5, and Week 6). This technique sets outliers beyond an

extreme point in the distribution equal to the closest observation (Tukey 1962; Chen and Dixon 1972); for each week we set values above the 99<sup>th</sup> percentile of minutes exercised equal to the 99<sup>th</sup> percentile and values below the 1<sup>st</sup> percentile equal to the 1<sup>st</sup> percentile. These values are summarized in TABLE 1.2. Second, E! participants may join the program as part of a team or as an individual. Some participants also opt-in to a more guided version of the E! program, where they are urged to increase their physical activity over time. To maintain consistency with Study 2 and avoid contamination from these factors, we restricted the analysis sample to participants who joined the program as individuals or who indicated that they always exercised alone (vs. with team members) and who did not indicate that they opted-in to the guided track. Third, to maintain consistency of the analysis sample over time, we only included participants in the analysis who reported in all four weeks of interest (baseline, Week 3, Week 5, and Week 6), who completed matched responses for both waves of the survey, and who provided responses to all the items in the models below. Four-hundred ninety-nine participants remained eligible for analysis.

The experiment proceeded as follows: Week 1 served as a baseline measure of exercise performance before any study contact. At the start of Week 2, participants were asked to consider their exercise for the upcoming week (Week 3) and were reminded to look at the exercise time goal that they had set in the E! program. We collected measures of goal intentions since some participants sign up for E! but display minimal commitment to achieving program objectives (these measures are found in APPENDIX 1.4). Participants were then randomly assigned to one of four conditions.

In the control condition, participants pursued their goal naturalistically with no direction to plan. In the if-then condition, participants first saw instructions for the planning intervention

and reviewed an example of two if-then plans for an unrelated goal (eating a healthy diet). Participants then specified one to four obstacles that could arise as they were pursuing the goal to exercise and they completed each plan statement by writing a corresponding action. In the when-where-how condition, participants saw instructions and a similar healthy eating example structured in a when-where-how format, and then they specified one to four actions that they could take as steps to move toward their goal. Participants completed each plan statement by elaborating on when, where, how, and for how long each step would take place. Finally, we introduced a fourth condition – hybrid plans – as an exploratory attempt to produce a more consistent and effective method of planning adapted from the principles contained in the Project Management Book of Knowledge (Project Management Institute 2008), an industry guide for project management professionals. We wanted participants to form plans that included elements of both steps and obstacles, and to integrate both of those pieces together rather than considering actions in isolation. Participants saw instructions and an example of this type of plan for an unrelated healthy eating goal. Then they were asked to specify one to two broad categories of steps that they would take to pursue their exercise time goal. For example, a participant might list, “cardio exercise,” or, “staying motivated.” The rationale behind first listing categories is to encourage participants to think broadly about what they need to do to achieve the goal. Participants then elaborated upon each of these categories by specifying what specific actions they would take for each category, and by whom (e.g. on their own, with friends, etc.), how, when/for how long, and where the action would be executed. Hybrid participants then specified one to two obstacles that they thought might arise during goal pursuit, and an associated action using an if-then format. Lastly, participants ordered all of their plan statements (both steps and obstacles) in the sequence they expected to carry out each action. However, the hybrid condition

did not yield results different from setting no plan. Consequently and because it was not the main focus of our investigation, it will not be discussed further, though the results of the hybrid condition are summarized in FIGURE 1.4. Plans were summarized for participants at the end of the intervention and participants were asked to internalize them. They were also emailed a copy as a reminder. The Week 2 survey also included items measuring intentions and expectations for exercise in Week 3, and demographic items. Participants then received a follow-up survey in Week 4. Participants who formed plans were reminded of them and were asked whether they had the opportunity to carry out each action and whether they actually did so. Participants then gave a subjective assessment of their performance over Week 3, indicated an emotional response, and provided measurements of how well they carried out steps and overcame obstacles. We then collected intentions / expectations for future weeks of exercise. At the end of E!, we received individualized data from the online tracker for all six weeks of the program. Measures used in the following model are found in APPENDIX 1.4.

### *Results*

To account for individual natural differences in commitment to E! program goals and to the desire/ability to exercise, we controlled for goal intentions (measures summarized in APPENDIX 1.4) and minutes of exercise in the baseline week. As in the academic achievement study, an ANOVA with planned contrasts revealed no effect of implementation intentions on minutes exercised for the week immediately following the planning manipulation, compared to control ( $M_{CTRL} = 277.28$ ,  $SE_{CTRL} = 9.70$ ;  $M_{IT} = 267.35$ ,  $SE_{IT} = 10.21$ ,  $F_{IT-CTRL}(1, 493) = .50$ ,

$p = .48$ ;  $M_{\text{WWH}} = 286.45$ ,  $SE_{\text{WWH}} = 9.74$ ,  $F_{\text{WWH-CTRL}}(1, 493) = .44$ ,  $p = .51$ )<sup>7</sup>. Following Study 2, we estimated a serial multiple mediator regression model (Hayes 2013; Hayes and Preacher 2014) to evaluate the effect of setting plans on exercise for the week after the follow-up survey (Week 5); we expected that the indirect process that influenced studying behavior over time to also contribute to the number of minutes that participants exercised.

Recall that, as the first step in this model, we predicted the inflexibility inherent in obstacle coping plans would negatively influence the evaluation of the actions that were and were not carried out in service of the goal. In Study 2, we found that setting if-then plans reduced evaluations of how well participants coped with obstacles they tried to overcome during goal pursuit. However, in that study we did not ask about how well participants enacted steps. We predicted that the same inability to pivot outside the bounds of the plan and corresponding reduced evaluations for participants who formed coping plans would apply to later judgments about both obstacles and steps; the critical point is that forming an obstacle-focused coping plan narrows one's cognitive focus to situations to execute in-plan means, to the detriment of other possible goal-consistent but unplanned opportunities. Indeed, the items for facilitative actions and obstacle coping were highly associated ( $\alpha = .89$ ), so we averaged them for further analysis.

Using this combined measure, if-then planners reported that they did a worse job of acting in service of the goal, compared to control ( $\beta_{\text{IT-STEP/OBST}} = -.18$ ,  $t(493) = -2.06$ ,  $p = .04$ ). As in the academic achievement study, this perceived shortcoming led to a corresponding increase in regret about goal performance – in this case, the number of minutes exercised during Week 3 ( $\beta = -.56$ ,  $t(492) = -14.32$ ,  $p < .001$ ). In turn, regret led to a decrease in future outcome

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<sup>7</sup> Means reported above are estimated marginal means, which incorporate the covariates. The unadjusted means are as follows:  $M_{\text{CTRL}} = 278.16$ ,  $SD_{\text{CTRL}} = 169.50$ ;  $M_{\text{IT}} = 271.47$ ,  $SD_{\text{IT}} = 166.43$ ,  $F_{\text{IT-CTRL}}(1, 495) = .10$ ,  $p = .75$ ;  $M_{\text{WWH}} = 287.23$ ,  $SD_{\text{WWH}} = 176.22$ ,  $F_{\text{WWH-CTRL}}(1, 495) = .20$ ,  $p = .66$ .



expectancy – participants estimated that they had a lower chance of achieving their future exercise goals ( $\beta = -2.57, t(491) = -5.43, p < .001$ ), which resulted in participants exercising for fewer minutes during Week 5 ( $\beta = 1.12, t(490) = 2.74, p = .01$ ). Bias-corrected bootstrapping (10,000 samples; 95% confidence intervals) confirmed that this indirect path was significant for if-then planners, versus control ( $\beta = -.2945$ , Lower CI<sub>IT</sub>: -1.0053, Upper CI<sub>IT</sub>: -.0440).

Interestingly, the indirect effect continued to influence exercise time for if-then planners in Week 6, revealing that plans guided habits for these participants over the rest of the program (see FIGURE 1.5).

These results represent an indirect-only mediation (Zhao et al. 2010) in a similar pattern to Study 2, with some key differences. While the total effect of setting an if-then plan was not significant, again we see evidence of opposing processes at work that mask the effects of setting if-then plans (see FIGURE 1.4). Overall, if-then planners exercised for more minutes ( $M_{IT} = 279.66, SE_{IT} = 10.91$ ) than control participants ( $M_{CTRL} = 262.84, SE_{CTRL} = 10.37$ ), which represented a non-significant difference ( $\beta = 8.41, t(493) = 1.12, p = .26$ )<sup>8</sup>. However, this effect is composed of the significant indirect effect we have described above, which has a negative effect on minutes exercised, and a marginal direct effect from X-Y ( $\beta = 11.58, t(490) = 1.58 = .11$ ), which has a positive effect on minutes exercised, holding the indirect path constant. In other words, the two paths oppose each other. Thus, the effect of setting if-then plans on the number of minutes exercised should be strengthened if the negative indirect path through action monitoring, regret, and changes in outcome expectancy were to be reduced, either by changing the nature of regret or outcome expectancies. Unlike in Study 2, in this context there emerged a significant

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<sup>8</sup> Means reported above are estimated marginal means, which incorporate the covariates. The unadjusted means are as follows:  $M_{CTRL} = 263.38, SD_{CTRL} = 179.70; M_{IT} = 283.53, SD_{IT} = 159.74, t_{IT-CTRL}(495) = .99, p = .32; M_{WWH} = 275.51, SD_{WWH} = 165.24, t_{WWH-CTRL}(495) = .61, p = .54$ .

and negative link between regret and outcome expectancy – as regret increased, outcome expectancy decreased. Below, we outline experience as a key reason driving this this difference.

As in Study 2, when-where-how planners displayed no changes in their evaluations of past actions compared to control ( $\beta_{\text{WWH-STEP/OBST}} = -.11$ ,  $t(493) = -1.29$ ,  $p = .20$ ); as a result, the indirect path was not significant ( $\beta = -.1792$ , Lower  $CI_{\text{WWH}}: -.7006$ , Upper  $CI_{\text{IT}}: .0265$ ; see FIGURE 1.4).

Finally, the properties of regret again make it the most theoretically appropriate emotion to include in the model. However, we also collected other measures to further hone in on participants' emotional response. In addition to regret, participants were also asked to report how much they felt happy, fulfilled, satisfied, determined to improve, and as though they wished they could change the situation in regard to their exercise performance. Consistent with the results of Study 2, the positive emotions did not yield significant indirect effects when inserted in place of regret, as they were not related to participants' expectations of the future. Similarly, the path including “determined to improve” failed to reach significance. However, consistent with the experience of regret as an emotion rooted in counterfactual thought, the indirect path including “Wishing I could change the situation” in place of regret was also significant. Results of these supplemental analyses may be found in APPENDIX 1.5.

---INSERT FIGURE 1.4 ABOUT HERE---

#### *Task experience moderates the link between regret and outcome expectancy*

Across both field studies, related indirect processes emerged. Setting when-where-how plans, which focused on facilitative actions, did not impact participants' assessments of their performance. However, setting obstacle-focused if-then plans led these participants to perceive

that they did a worse job at coping with obstacles (in Study 2) and a worse job at coping with both obstacles and executing facilitative steps (in Study 3). This recognition of substandard performance produced regret about the level of achievement in service of the goal. However, this regret had different consequences depending on the context. In the academic achievement study, regret did not feed into reduced expectations about the future and it had a positive influence on intentions to study for a subsequent exam. Conversely, in the E! study, regret spurred if-then planners to report lower outcome expectancies about their chances for future goal achievement, exerting a downward influence on performance.

What could account for this difference, given the similar process findings shared across both studies? Consider that experience may play an important role, and one that is worthy of continued scrutiny. The participants in the academic achievement study were veteran students, having spent the majority of their lives in formal education. It is highly likely that most of them recognize the inevitability of some academic setbacks, and they are used to “bouncing back.” Conversely, E! participants are a mix of veterans and relative rookies – respondents reported participating between 0 and more than 10 previous times ( $M = 3.59$ ,  $SD = 2.97$ ). We predicted that those with less experience should be more likely to believe that the deficiencies made salient by plans are more permanent or indicative of ability, reducing outcome expectancies.

Thus, we conducted a conditional process analysis (Hayes 2013; also commonly referred to as a “moderated mediation”) to determine whether the relationship between regret, outcome expectancies, and future performance was moderated by the number of prior times a participant had completed the E! program. Specifically, we predicted that the link between regret and reduced outcome expectancies would be stronger for less experienced participants, compared to those with more E! experience. To allow for serial mediation and moderators in the same model,

we extracted the relevant variables and ran the conditional process component separately, using regret as the independent variable, outcome expectancy as the mediator, Week 5 exercise minutes as the DV, and experience as the moderator of the path between regret and outcome expectancy. The preceding variables in the serial mediation model (plan type and behavior monitoring) were entered as covariates so that the regression equation for the dependent variable (Week 5 minutes) matched that of the serial model and the regression equation for the regret mediator matched the serial model, with the addition of the experience main effect and the regret by experience interaction. We also continued to control for baseline exercise minutes and goal intentions.

The conditional process analysis confirmed moderation by experience (see FIGURE 1.6). The interaction of regret and experience on outcome expectancy was significant ( $\beta = .35$ ,  $t(489) = 2.40$ ,  $p = .02$ ). For participants 1SD below the mean and at the mean of previous E! participation occasions, regret led to reduced outcome expectancies and minutes exercised for Week 5, as described above ( $\beta_{-1SD} = -3.9996$ , Lower CI  $_{-1SD} = -7.7399$ , Upper CI  $_{-1SD} = -1.5188$ ;  $\beta_{MEAN} = -2.8345$ , Lower CI  $_{MEAN} = -6.2640$ , Upper CI  $_{MEAN} = -.8677$ ). Conversely, for E! veterans 1 standard deviation above the mean, this path was not significant ( $\beta_{+1SD} = -1.6693$ , Lower CI  $_{+1SD} = -5.6611$ , Upper CI  $_{+1SD} = .2597$ ). The index of moderated mediation was also significant ( $\beta = .3913$ , LLCI:  $.0257$ , ULCI:  $.9564$ ), indicating that the conditional effects for any two values of the moderator differ from each other (Hayes 2015). Further, note that the coefficients of the indirect path are less negative as experience rises. In other words, with more experience, regret led to less of a drop in outcome expectancies. As additional evidence of the role of experience in the link between regret and outcome expectancy, further analysis using a simple moderation and the Johnson-Neyman technique revealed that this regret-outcome

expectancy link was significant for respondents who had participated in the E! program approximately 7 times or fewer (specifically, 6.9313 times), but not for those with more experience, with the coefficients consistently becoming less negative (and positive for those who have participated in E! for more than 10 prior occasions). This mirrors the pattern observed between regret and outcome expectancy in Study 2. Following the trend for the current analysis, the relationship there between regret and outcome expectancy was positive for the student participants (all of whom are very experienced at pursuing study goals), though it similarly did not reach significance ( $\beta = .09$ ,  $t(229) = 1.47$ ,  $p = .14$ ).

Thus, we see preliminary evidence that experience moderates the observed link between regret and future goal intentions and actions. For novices who have few times in the past when they have pursued the goal, the current attempt garners much weight in developing expectations for how the future will unfold – for example, if one has only been an E! participant for a short while, feeling regretful over failures to execute one’s intentions seem more likely to lead to thoughts like, “I feel bad...maybe this isn’t for me.” Thus, regret leads those individuals to expect worse performance in the future and exerts a negative effect on their upcoming progression toward the goal. In contrast, for those who possess more experience and, in turn, have more events to input into a forecast of future goal pursuit – for example, students who have many years of preparing for tests and exams under their belt – the impact of the current attempt is reduced and regret may spur the individual to push harder to achieve the goal.

---INSERT FIGURE 1.6 ABOUT HERE---

### *Discussion*

Thus, in two diverse settings with consequential goals, setting implementation intentions led to a set of intriguing findings. By examining the goal pursuit process at multiple time points both before and after performance feedback, once more we observed the influence of an indirect process masking the effects of plans over time, as individuals reflected upon their actions and considered the implications for future performance.

Again, feeling as though one had not lived up to the means outlined in the plan led if-then planners to reduce their overall evaluations of performance and express regret over the deficiency. Here, this regret was often damaging – it led to a reduced expectation that success would occur in the next week, and subsequently to a reduction in exercise behavior. This process persisted through week six of the program, suggesting that its effect was enduring.

However, the sting of regret did not appear to impact everyone in the same way. Consistent with the regret literature (Inman 2007), across Studies 2 and 3, regret had both motivating and demotivating consequences, depending upon the individual's degree of experience with the goal. For novices, the regret that comes from recognizing deficient performance can be damaging, leading to reduced outcome expectancies and action.

While the role of experience is an interesting and exciting addition to the larger process model, from these analyses, we cannot definitively conclude that the entire indirect path from plan type to minutes exercised was moderated by experience, as the moderation tested only the link between regret, outcome expectancy, and exercise minutes. The selection of this particular portion of the model was driven by extant theory, but it would be instructive to confirm that the moderation affects the entire indirect path, and efforts to do so are ongoing. To further examine the generality of these findings in addition to the variables in the main model, we also conducted a series of supplemental analyses that may be found in APPENDIX 1.6.

Further, other factors besides experience may have also accounted for the differing role of regret. For example, participants in Study 2 were pursuing a goal (studying) for which the ultimate goal (performance on an evaluation) is somewhat difficult to escape, with short-term and salient consequences for poor performance. In contrast, participants in Study 3 were pursuing a goal (exercising) associated with more long-term and delayed consequences (e.g. general health, feeling good, weight loss, etc.), where giving up is easier. It is possible that regret is more likely to lead to a facilitative response like, “I *have* to do better next time, or else,” in the former context while it may be more likely to cause reduced future expectations in the latter (“I’m not going to be able to exercise enough, maybe this program isn’t for me.”). We plan to investigate this explanation in future work.

Unfortunately, hybrid plans did not lead to improved performance in service of the goal. We are continuing to refine the concept of hybrid plans and leave broader conclusions about them to future research.

Finally, in both field studies, we observed no differences in the performance of when-where-how planners versus control, suggesting that considering steps likely occurs naturally for the types of goals that we studied, stronger manipulations are needed, or different processes guide behavior for this type of plan. These possibilities seem ripe for future research.

## GENERAL DISCUSSION

This research makes two major contributions to the literature on planning, goals, and self-regulation that contribute to our understanding of why sometimes plans work and sometimes they do not. First, we demonstrate that different types of plans focus individuals on different means to achieve their goals. To date, plan format has received little attention in the literature, and different types of implementation intentions have largely been considered to be equivalent. However, we demonstrate that participants who set if-then plans are more likely to consider ways to overcome obstacles, while participants who set when-where-how plans focus more intently on facilitative actions. This difference in content is critically important, as the means identified in the plan should guide action as goal pursuit is underway.

Our second contribution illuminates a previously underexamined mechanism linking implementation intentions and long-term success. Most work on planning has focused on goal achievement as the critical outcome, often in the short-term. However, little attention has been paid to indirect processes – in this case, how plans alter the subjective experience of goal pursuit and how this experience changes engagement with the goal over time – or not. Indeed, the complex and consequential contexts studied in this paper – shopping for loved ones, professional achievement, and personal health – seem most likely to generate a diverse set of cognitions and feelings that would lead to such processes compared to more peripheral goals. By studying them, we more thoroughly approximate how such interventions might work in real consumer contexts.

The process model that we propose and validate – that plans which focus individuals on obstacles hinder flexibility in the goal monitoring process, leading to regret, changes in outcome expectancy, and performance over time – adds significantly to our understanding of how planning influences goal pursuit for consumer goals that require the ongoing regulation of



behavior. Specifically, if-then coping plans which make it more likely that individuals will perceive deficiencies in their goal-directed actions also cause an increase in regret. This regret can be motivating when experience with the goal is quite high, but feeds into reduced outcome expectancies when experience is low. Further, these perceived action deficiencies can also impact outcome expectancies directly, making individuals believe that future success is less likely.

As a result, these findings contribute to the small but growing literature showing inconsistent or harmful effects of implementation intentions (e.g. Bayuk et al. 2010; Dalton and Spiller 2012; Townsend and Liu 2012) by illuminating previously unstudied paths that can hinder or facilitate the success of planning. In particular, our results build upon Townsend and Liu's (2012) discovery that the concrete nature of planning creates a link between planning, a general sense of emotional distress, and future action when the distance to achieve the goal is large. We complement this foundation by further investigating the role of a discrete emotion – regret – and demonstrating that the resulting action can contribute to either the hindrance or facilitation of goal achievement, depending on task experience. Indeed, it seems likely that novices would be most likely to have a large gap between their present state and successful achievement of the goal. Likewise, our results are also consistent with Dalton and Spiller's (2012) finding that planning makes salient the difficulty of achieving multiple goals, undermining performance. Though we did not inquire about other goals, it is likely that participants in our field contexts were also pursuing other responsibilities; indeed, the novices who experienced performance decreases in our studies also seem most prone to perceive difficulty balancing multiple goals. Our results illuminate an additional, novel process for the role of plans in complex situations.

### *Implications*

Recently, Ordóñez and her colleagues (2009) issued a “warning label” for goal setting, arguing that when companies and managers indiscriminately set specific, challenging goals for employees, a number of unintended side effects can occur. Rather than thinking of goals as an “over-the-counter” remedy for organizational challenges, Ordóñez et al. argue that companies should dispense goals as “prescriptions,” and be mindful that sometimes their use can cause harm as well as benefit. It appears apt to apply similar practical recommendations to implementation intentions.

Overall, planning is often beneficial, but its efficacy would be enhanced by following three sets of recommendations. First, using if-then plans to invoke thoughts about how to cope with obstacles and prompt increased monitoring of behavior yields the most significant impact in terms of the potential for behavioral change, at least in terms of the contexts and processes that we have outlined here. Indeed, this is consistent with people’s natural tendency to consider steps but not how to cope with obstacles (e.g. Buehler et al. 1994). However, interventions such as when-where-how plans which guide the user to consider steps may prove to be more beneficial in situations that are completely novel or daunting, where there may be a natural tendency to think of the obstacles one faces and where there is a real need to elaborate upon how to “get from point A to point B.” For example, someone who has devoted little attention to saving for retirement and as a consequence is starting to save in middle-age may naturally think of all the obstacles that they will face as they try to accumulate sufficient funds in the upcoming years and think insufficiently about concrete steps to reach the goal. In this case, a when-where-how plan may prove to be more impactful because it is a more significant departure from one’s natural thought patterns.

Second, we observed that regret can yield motivational benefits for those with task experience, but feeds into reduced outcome expectancies for inexperienced people. What seems needed is a way to help novices to derive the same motivational benefits from regret as people with more experience. Part of the problem may be that some consumers specify elements in their plans that are unrealistic or not germane to achieving their goals. After experiencing setbacks, people may look to these poorly formed plans as evidence that they do not have a good understanding of the goal, when in fact what is needed is to change the plan. It appears reasonable to believe that novices would be more susceptible to forming plans that are unfocused or too difficult to achieve. Indeed, this seems particularly true in the if-then condition, where participants are asked to start by thinking of a scenario where action might be necessary. If one's experience with the goal is limited, thinking about possibilities that might arise (in particular, obstacles, which the planning fallacy literature and our own data tell us people do not frequently consider) is likely to be quite challenging (see also Sniehotta et al. 2005). Firms or organizations that wish to influence consumer planning (e.g. a mortgage lender providing guidance to homeowners on repaying their loan) should consider that consumers likely have a broad range of experience levels and they should tailor their materials accordingly. For example, firms may wish to provide a version of a planning tool for novices where plans are pre-selected for consumers or they select options from a menu of possible alternatives to ensure that appropriate plans are being formulated.

Third, it seems critical to re-frame the link between perceptions of poor past performance and outcome expectancy such that people do not conclude that current setbacks make future success less likely. To do so, it may be appropriate to reassure that some setbacks are a normal part of goal pursuit (e.g. most everyone occasionally splurges on a night out with friends or

spends a bit of extra time in bed rather than being at the gym), that feelings of regret over those missed opportunities should not necessarily be interpreted as a sign of poor future performance or ability, and that competency with the goal is built over a period of time. Such an intervention might involve pairing planning interventions with a manipulation to encourage participants toward representing their goals as reflecting an opportunity to learn and build mastery over time rather than as a performance-oriented reflection of their abilities (Elliott and Dweck 1988).

### *Limitations*

While these findings represent an interesting and important step toward a more complete understanding of the processes underlying implementation intentions, they have some shortcomings. First, we revealed an indirect process that works through behavior monitoring, regret, outcome expectancies, and future action. This process is likely to also be accompanied by other complementary and competitive processes which remain a topic for future research. Second, though the data in the two field studies were collected in real settings with consequential goals, they remain self-report measures. We did not directly observe participants' studying time or exercise time, in an attempt to allow participants to pursue their goals in a setting that was naturalistic. While there exists the possibility of participants over-reporting their goal achievement, observation data may also suffer from participants acting differently because they know they are being observed (i.e. through the Hawthorne Effect). Third, it is possible that the observed effects could be explained by other factors that were not included in our model; for example, plans across conditions were different lengths, which may impact elaboration or memory processes. However, evidence against this notion is provided by the if-then inaction condition in Study 2, which removed only the link between planning and monitoring and did not

reveal the hypothesized path as a result. Thus, elaboration or memory effects are unlikely to explain the results.

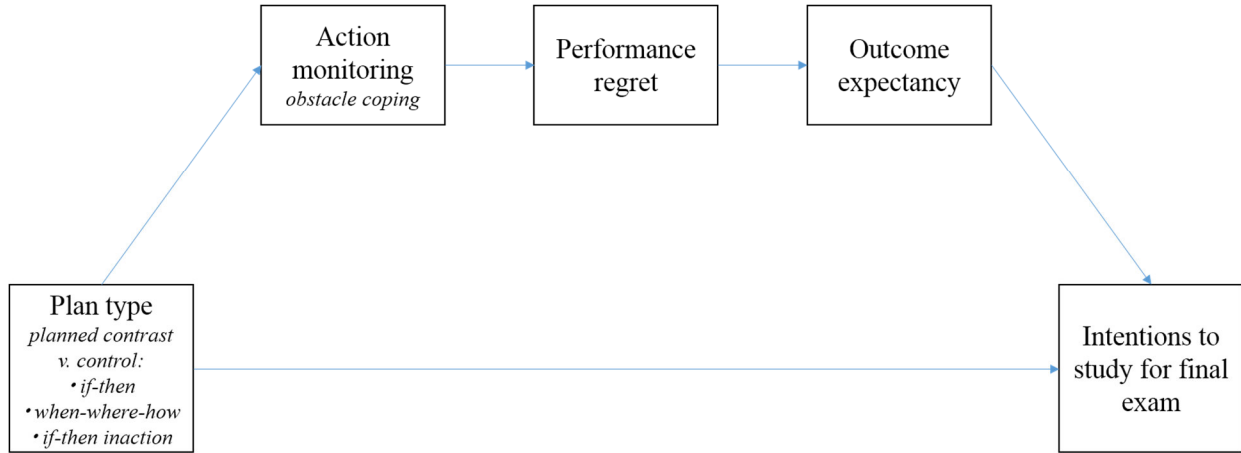
### *Future directions*

The type of goal at hand may also moderate the impact of our process model. In addition to the implications discussed above, some goals also provide more immediate opportunities to monitor success or failure. The effects of goals like exercising or studying take time to develop – after a run or a study session it is not clear whether those actions have caused a positive result. Thus, room exists for plans to increase monitoring. Conversely, goals like gambling or responding to the presence of stimuli (e.g. words on a screen) provide quick performance feedback. Here, plans are unlikely to facilitate additional behavior monitoring as the outcome is immediately apparent.

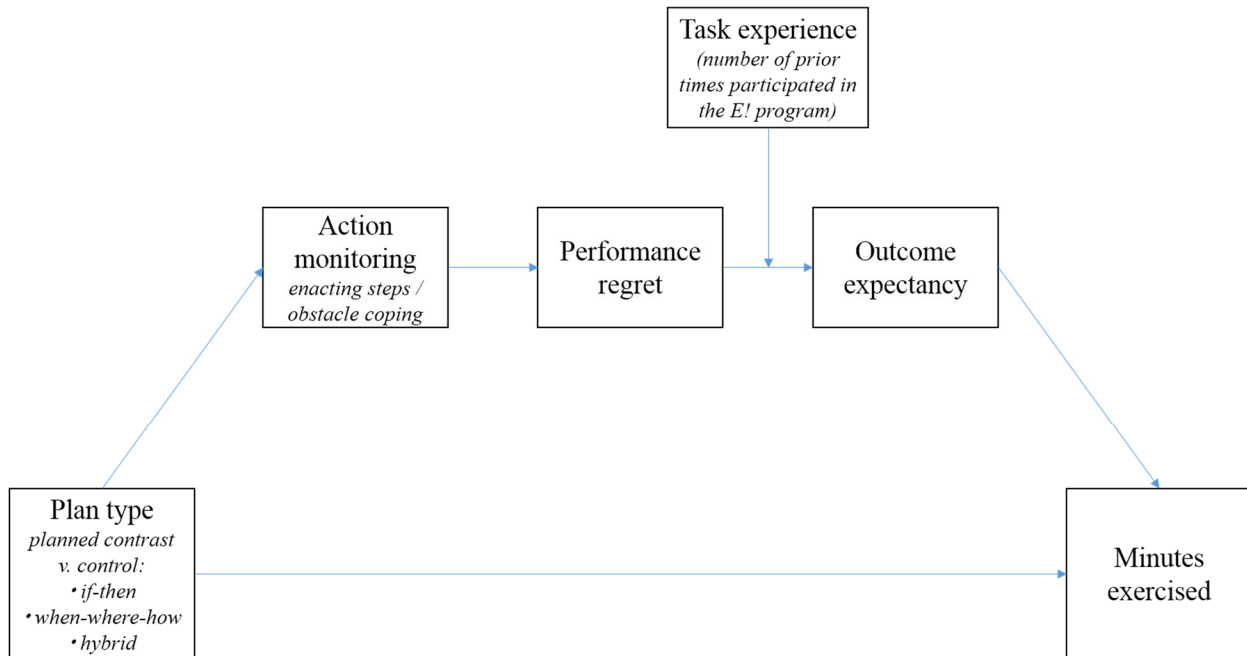
In sum, implementation intentions represent a promising tool for consumers and managers. However, we agree with Dalton and Spiller (2012) that their role in complex settings remains somewhat equivocal. Part of the problem is that researchers have been unsystematic in teaching consumers how to form plans, leading to changes in plan content. Second, the literature has devoted insufficient attention to indirect processes that help to explain and elaborate upon previously-found mechanisms. In contexts with complex and consequential goals, examining processes like monitoring and regret provides valuable theoretical and practical insight on how implementation intentions change the ways consumers feel and act during goal pursuit. We hope that our findings provide new explanations for self-regulation based on planning and point the way to future investigations into self-control in everyday consumption behaviors.

**FIGURE 1.1: DIAGRAMS OF SERIAL MEDIATION MODELS**

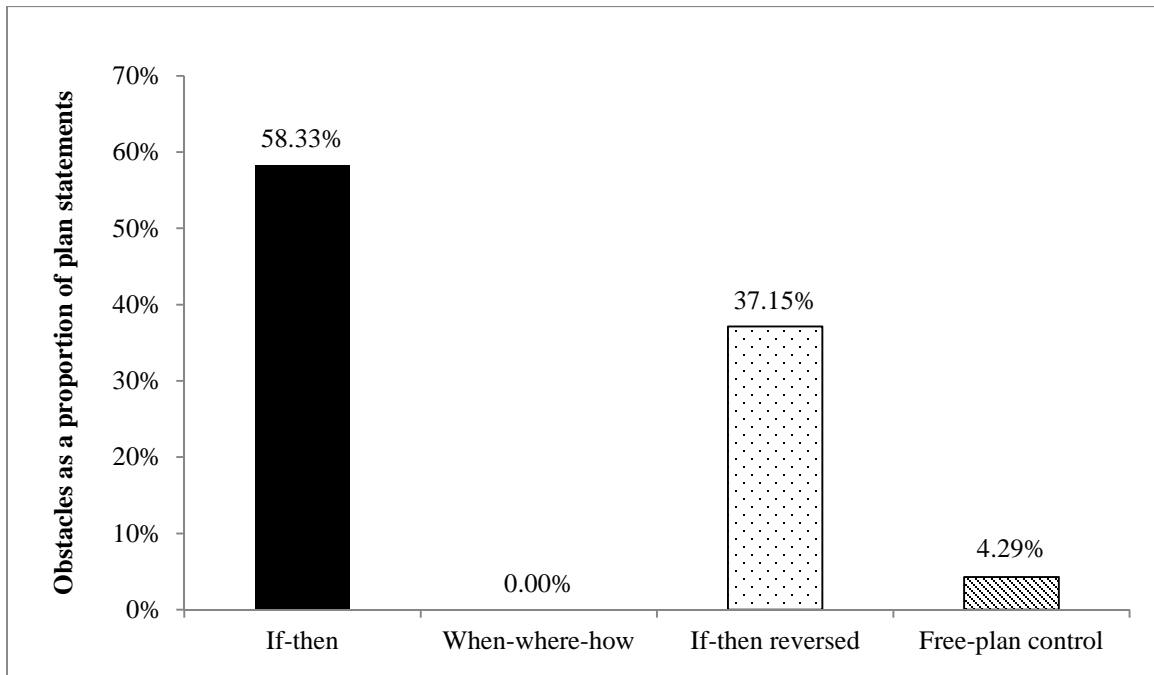
Study 2: Academic achievement



Study 3: Exercise! program

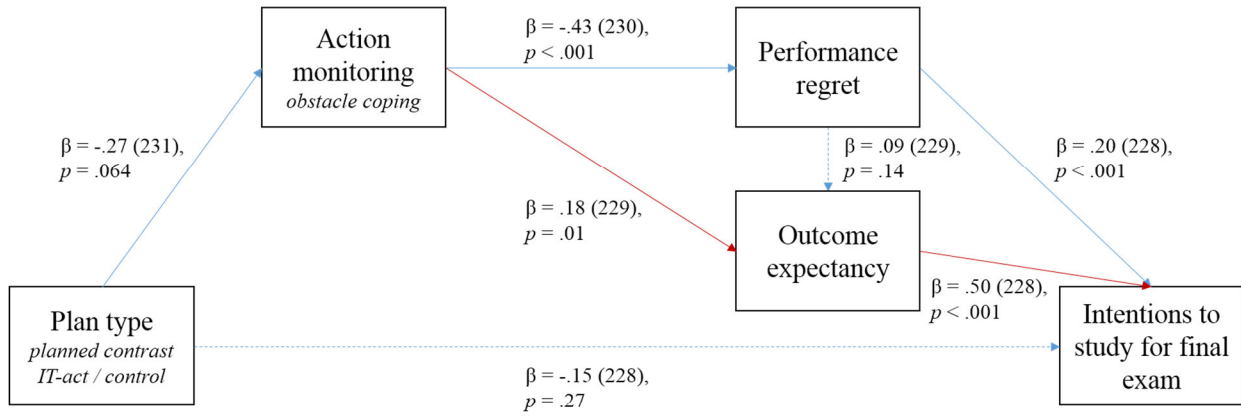


**FIGURE 1.2 OBSTACLE COPING PLANS AS A PROPORTION OF PLAN STATEMENTS - STUDY 1**



**FIGURE 1.3: SERIAL MEDIATION DIAGRAMS - STUDY 2**

*If-then action plans*



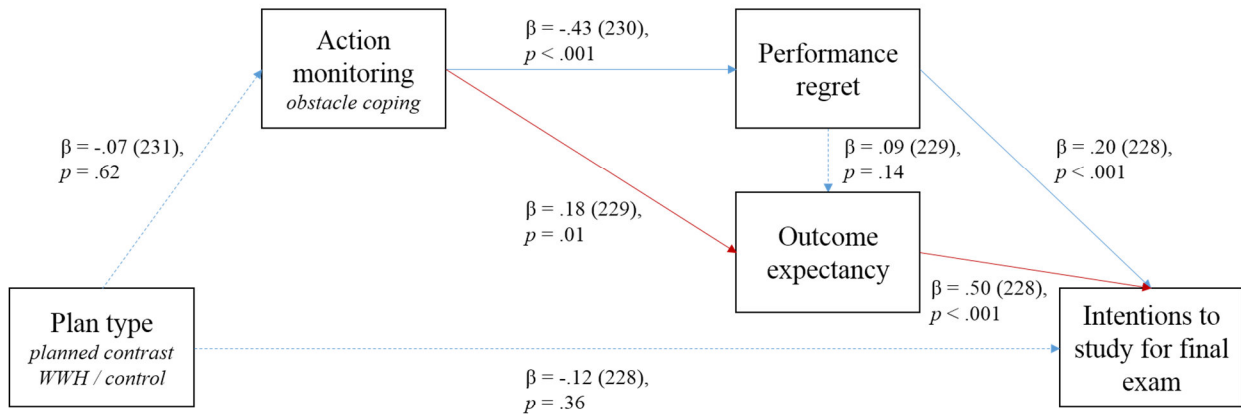
Indirect effect (10,000 bootstrapped, bias-corrected samples):

$$\beta_{\text{REGRET}} = .0239, \text{LLCI: } .0025 \text{ ULCI: } .0686$$

$$\beta_{\text{OUTCOME-EXP}} = -.0250, \text{LLCI: } -.0834 \text{ ULCI: } -.0010$$

$$\text{Total effect: } \beta = -.20, t(231) = -1.25, p = .21$$

*When-where-how plans*



Indirect effect (10,000 bootstrapped, bias-corrected samples):

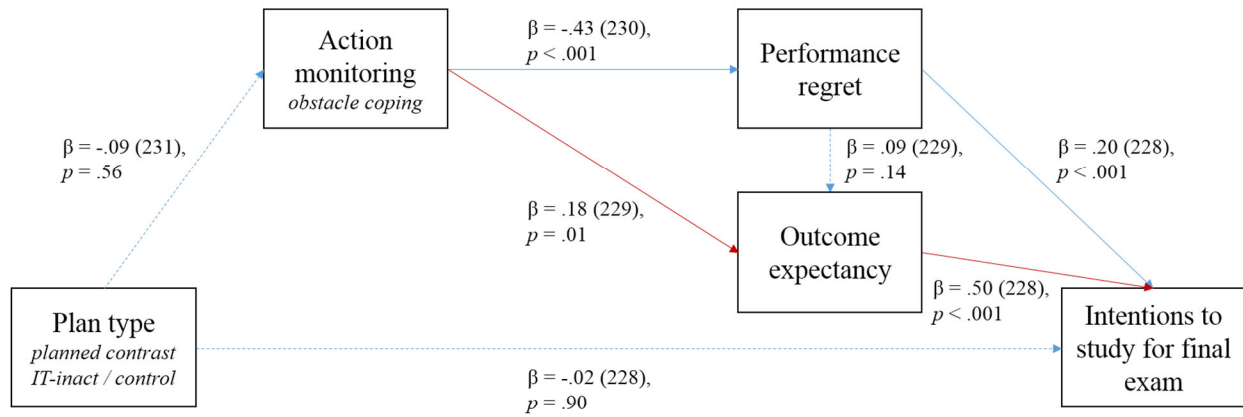
$$\beta_{\text{REGRET}} = .0063, \text{LLCI: } -.0162 \text{ ULCI: } .0400$$

$$\beta_{\text{OUTCOME-EXP}} = -.0065, \text{LLCI: } -.0456 \text{ ULCI: } .0160$$

$$\text{Total effect: } \beta = -.21, t(231) = -1.37, p = .17$$



*If-then inaction plans*



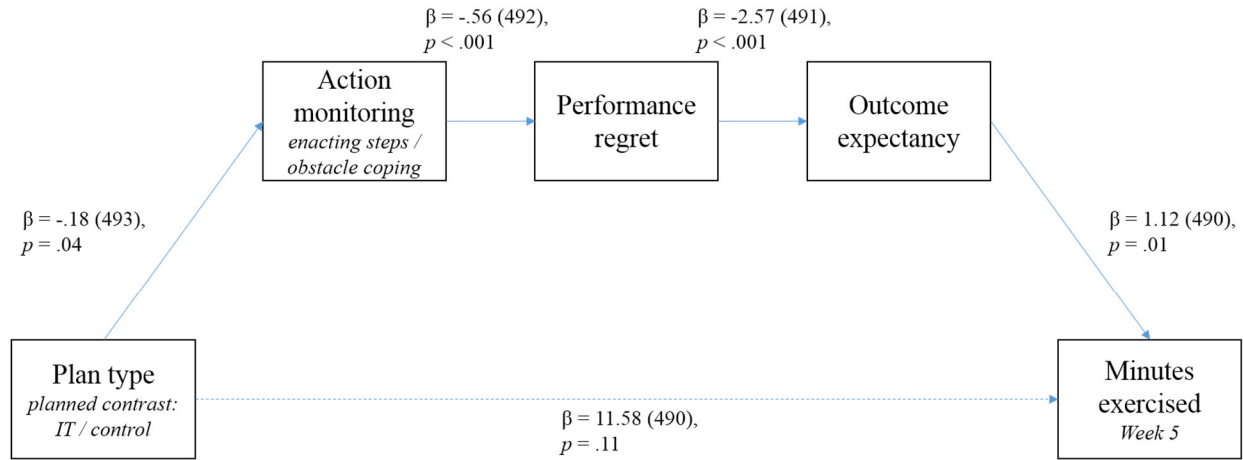
Indirect effect (10,000 bootstrapped, bias-corrected samples):

$\beta_{\text{REGRET}} = .0076$ , LLCI:  $-.0159$  ULCI:  $.0449$   
 $\beta_{\text{OUTCOME-EXP}} = -.0080$ , LLCI:  $-.0549$  ULCI:  $.0149$

Total effect:  $\beta = -.02$ ,  $t(231) = -.10$ ,  $p = .92$

**FIGURE 1.4: SERIAL MEDIATION DIAGRAMS (WEEK 5) - STUDY 3**

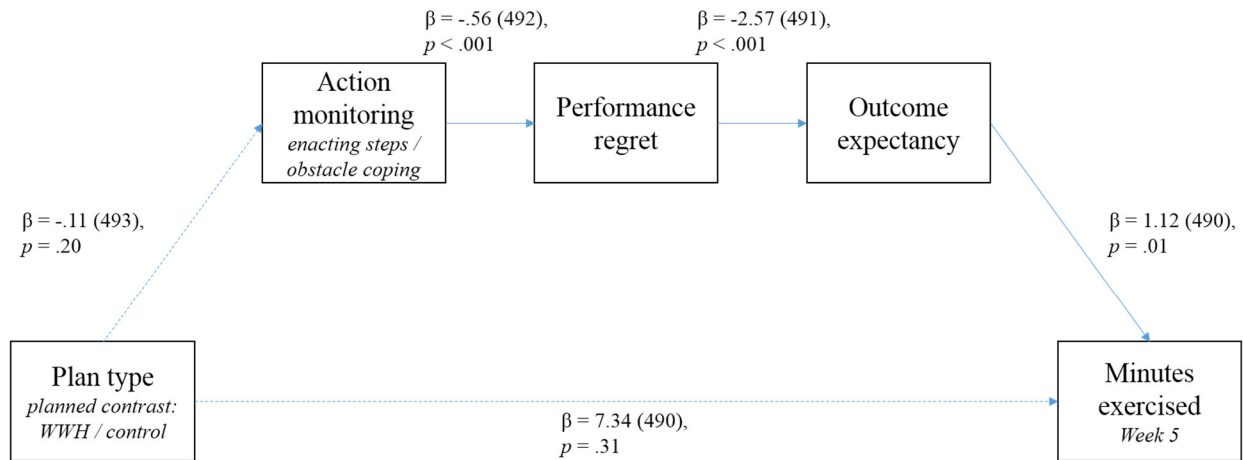
*If-then plans*



Indirect effect (10,000 bootstrapped, bias-corrected samples):  
 **$\beta = -.2945$ , LLCI:  $-1.0053$  ULCI:  $-.0440$**

Total effect:  $\beta = 8.41$ ,  $t(493) = 1.12$ ,  $p = .26$

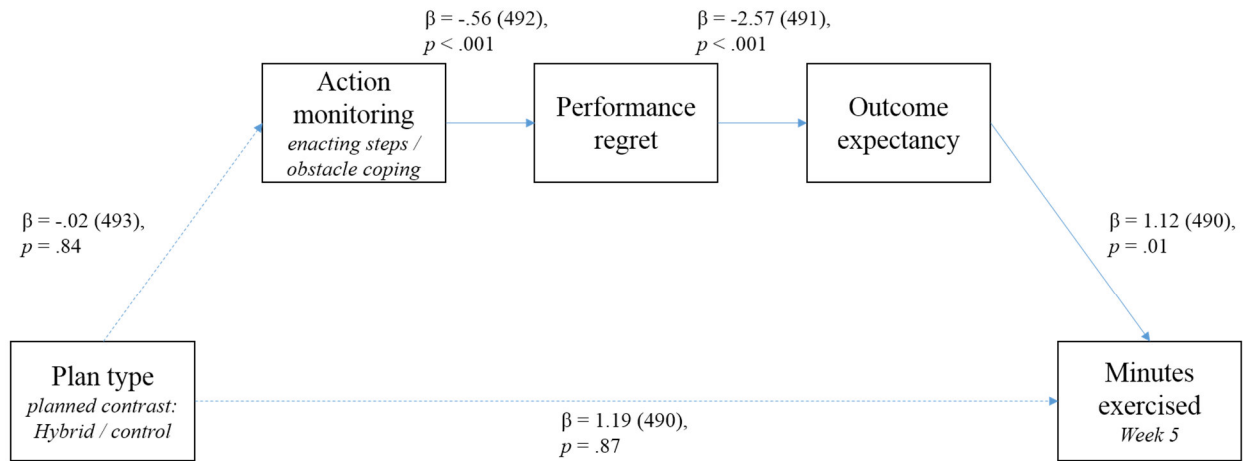
*When-where-how plans*



Indirect effect (10,000 bootstrapped, bias-corrected samples):  
 **$\beta = -.1792$ , LLCI:  $-.7006$  ULCI:  $.0265$**

Total effect:  $\beta = 5.83$ ,  $t(493) = .79$ ,  $p = .43$

Hybrid plans



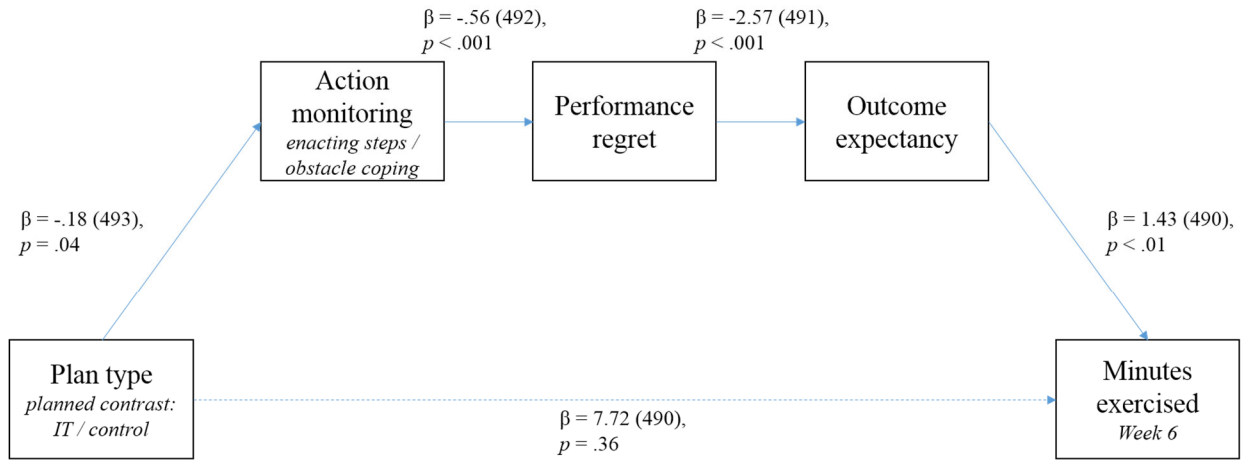
Indirect effect (10,000 bootstrapped, bias-corrected samples):

**$\beta = -.0287$ , LLCI:  $-.4246$  ULCI:  $.2764$**

Total effect:  $\beta = 2.82$ ,  $t(493) = .37$ ,  $p = .71$

**FIGURE 1.5 SERIAL MEDIATION DIAGRAMS (WEEK 6) - STUDY 3**

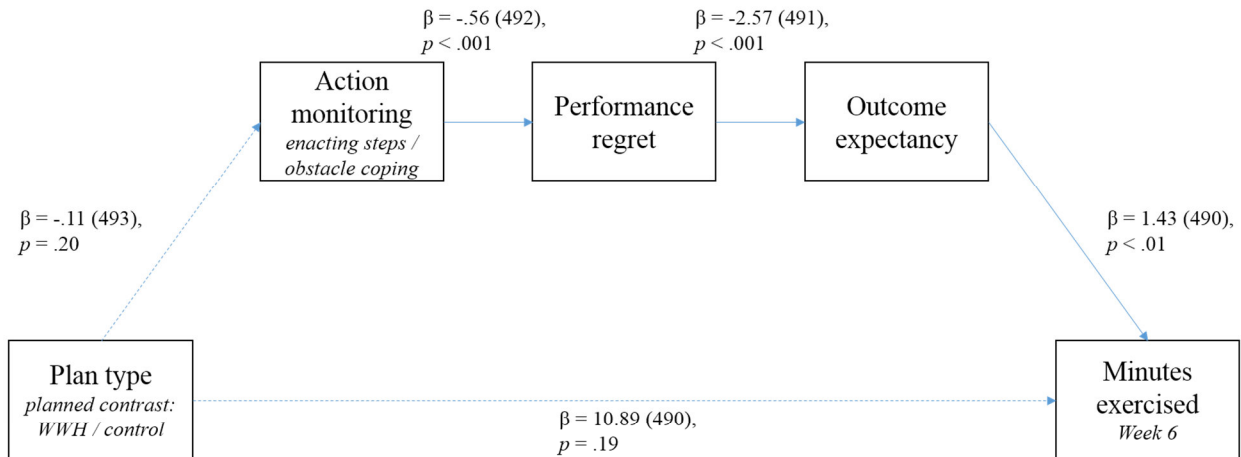
*If-then plans*



Indirect effect (10,000 bootstrapped, bias-corrected samples):  
 **$\beta = -.3755$ , LLCI:  $-1.1811$  ULCI:  $-.0615$**

Total effect:  $\beta = 5.36$ ,  $t(493) = .62$ ,  $p = .53$

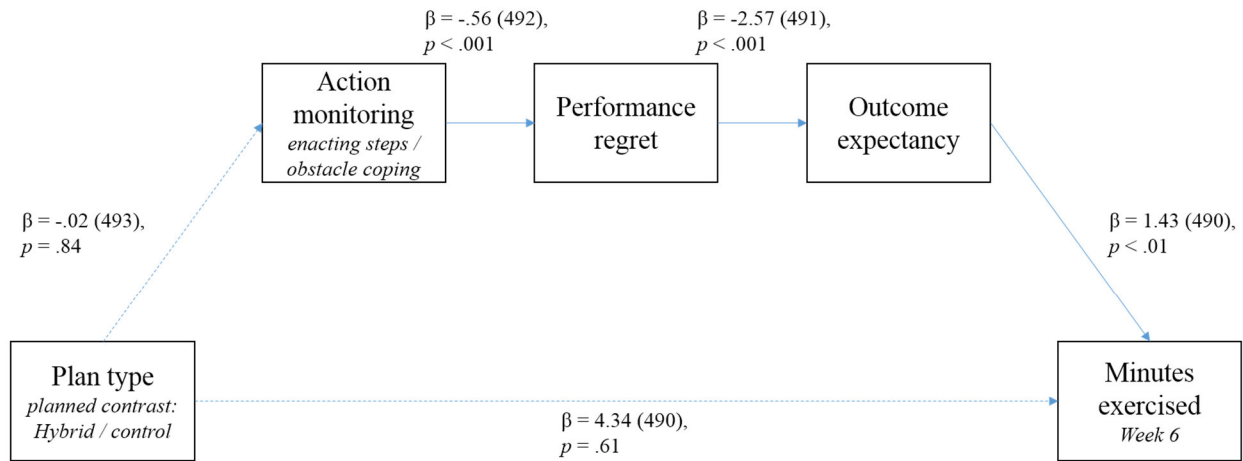
*When-where-how plans*



Indirect effect (10,000 bootstrapped, bias-corrected samples):  
 **$\beta = -.2286$ , LLCI:  $-.8735$  ULCI:  $.0469$**

Total effect:  $\beta = 9.27$ ,  $t(493) = 1.11$ ,  $p = .27$

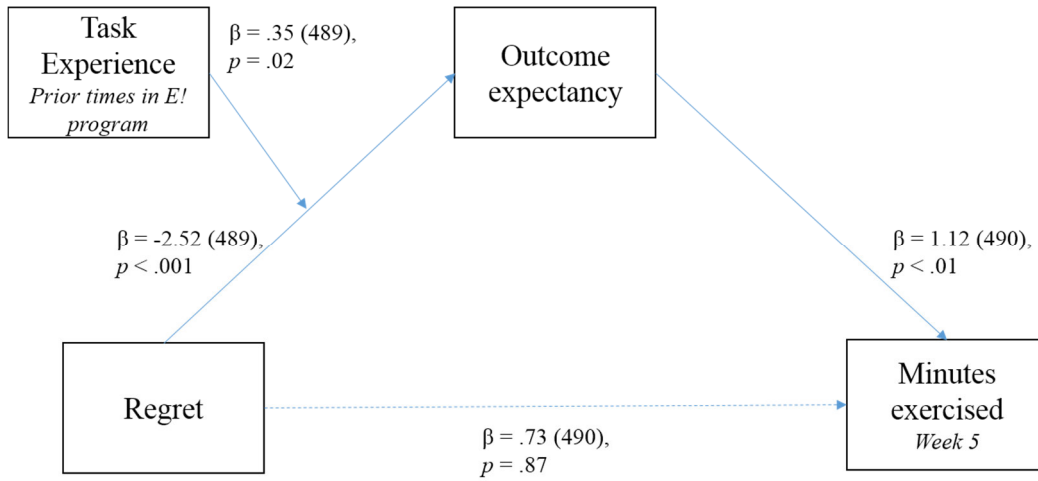
Hybrid plans



Indirect effect (10,000 bootstrapped, bias-corrected samples):  
 **$\beta = -.0366$ , LLCI:  $-.5119$  ULCI:  $.3514$**

Total effect:  $\beta = 6.33$ ,  $t(493) = .74$ ,  $p = .46$

**FIGURE 1.6: CONDITIONAL PROCESS ANALYSIS FOR MODERATION BY EXPERIENCE IN THE EXERCISE! PROGRAM - STUDY 3**



<b>Experience</b>	<b><math>\beta</math></b>	<b>Confidence interval (Lower : Upper; 95%)</b>
-1SD	-3.9996	-7.7399 : -1.5188 *
Mean	-2.8345	-6.2640 : -.8677 *
+1SD	-1.6693	-5.6611 : .2597

**TABLE 1.1: EXAMPLES OF OBSTACLE COPING PLANS AND STEP PLANS SHOWN TO PARTICIPANTS - STUDY 1**

	<b>Obstacle coping plan example</b>	<b>Step plan example</b>
If-then	If an item that I need to buy is out of stock, then I will use shopping apps on my phone while I'm at home to search for it at multiple retailers	If it's 5 pm and I am leaving campus, then I will take the bus to Briarwood Mall to shop for an hour for my family
When-where-how	<p>WHAT: Search for an item at multiple retailers</p> <p>WHEN: An item that I need to buy is out of stock</p> <p>WHERE: At home</p> <p>HOW: By using shopping apps on my phone</p> <p>FOR HOW LONG: Until I have all my gifts purchased</p>	<p>WHAT: Go to the mall to shop for my family</p> <p>WHEN: At 5 pm, as I am leaving campus</p> <p>WHERE: Briarwood Mall</p> <p>HOW: Take the bus there</p> <p>FOR HOW LONG: An hour</p>
If-then reversed	I will use shopping apps on my phone while I'm at home to search for an item at multiple retailers if the item that I need to buy is out of stock	I will take the bus to Briarwood Mall to shop for an hour for my family if it is 5 pm and I am leaving campus
Free plan	I will use shopping apps on my phone while I'm at home to search for out of stock products at multiple retailers	I will take the bus to Briarwood Mall to shop for an hour for my family as I am leaving campus at 5 pm

NOTE: These are the same examples that were presented to participants. The order for whether the step plan / obstacle coping plan was presented first was randomly counterbalanced.

**TABLE 1.2: REPORTED MINUTES EXERCISED BY WEEK - STUDY 3**

	<b>Week 1</b>	<b>Week 3</b>	<b>Week 5</b>	<b>Week 6</b>
Mean	245.74	264.81	266.10	257.97
Minimum / Maximum	0 / 1079	0 / 1590	20 / 2350	10 / 2330
1 <sup>st</sup> percentile	30	30	40	30
99 <sup>th</sup> percentile	870	930.30	937.10	895.77
Winsorized mean	244.92	262.50	261.48	254.83



## APPENDIX 1.1: PLANNING INSTRUMENTS AND MEASURES - STUDY 1

Plan type	Format of planning instrument	
<i>If-then</i>	IF (fill in a situation)	<input type="text"/>
	THEN (fill in an action)	<input type="text"/>
<i>When-where-how</i>	WHAT (fill in an action)	<input type="text"/>
	WHEN (fill in a time or situation when you will perform that action)	<input type="text"/>
	WHERE (fill in a place or setting where you will perform that action)	<input type="text"/>
	HOW (fill in ways that you will complete that action)	<input type="text"/>
	HOW LONG (fill in the duration of time that you will perform that action)	<input type="text"/>
<i>If-then reversed</i>	ACTION (fill in an action)	<input type="text"/>
	IF (fill in a situation)	<input type="text"/>
<i>Free-plan</i>	To get started, fill in the blank below with the first part of your plan:	
	<input style="width: 100%;" type="text"/>	

In addition to the measures described above and in the main body of the paper, participants judged how effective their plan would be at helping them to finish their shopping, generated alternate situations in which they could use their plan, and judged the ease of doing so. They also answered items on their typical shopping behaviors and intentions to complete shopping this year, chronic regulatory focus orientation (based on Lockwood, Jordan, and Kunda 2002), elaboration on potential outcomes (Nenkov, Inman, and Hulland 2008), an attention check, and demographic measures.

## **APPENDIX 1.2: ITEMS INCLUDED IN SERIAL MEDIATION MODEL - STUDY 2**

### **Action monitoring**

- How well did you overcome obstacles that prevented you from studying? (7-pt scale; 1 = “Not at all well” to 7 = “Very well”)

### **Regret (all 7-pt scales; 0 = “Not at all” to 6 = “Very much”)**

- How much do you regret your level of achievement on your study time goal?
- How much do you regret setting your study time goal?
- How much do you regret the plans you set to achieve that study time goal?

### **Outcome expectancy**

- How likely are you to achieve that study time goal for your final exam? (7-pt scale, 1 = very unlikely, 7 = very likely)
- Note: Much work (e.g. Bandura 1977) has drawn a distinction between outcome expectancies and self-efficacy, defining the former as the belief that one’s actions will lead to a desired outcome and the latter as the belief that one has the capability to successfully execute desired behaviors. To use an unrelated example of saving money to buy a home, an individual may believe or not believe that she is capable of executing contributory actions like bringing lunch to work or cutting utility bills (self-efficacy) and she may also make a judgment that these actions will or will not allow her to reach the outcome of saving the amount of money necessary to buy her chosen home (outcome expectancy). Both this measure and the similar measure used in Study 3 focus primarily upon the participant’s assessment of whether or not the focal outcome will be achieved (i.e. whether the individual will achieve the goal to study or exercise for a particular amount of time). Thus, we argue that the measure is most accurately conceptualized as outcome expectancy.

### **Future goal intentions**

- How likely are you to also set a challenging study time goal for your [class name / number] final exam? (7-pt scale; -3 = “Definitely unlikely,” 0 = “Fifty-fifty chance,” 3 = “Definitely likely”)

In addition to the measures described above and in the main body of the paper, during Wave 1 participants also completed items on their confidence about achieving their goal and doing well on the quiz, the importance of the quiz and studying, their prediction for their grade, their intentions and likelihood to study, how close they were to achieving their goal and doing well on the quiz, the ease of achieving their goal, and for participants in the planning conditions, their intentions, likelihood, and confidence of achieving their plan. During Wave 2, participants

completed items on their judgment for how completely they achieved their goal, whether they started earlier/later and studied more/less per day than they intended, counterfactual judgments about how they acted while pursuing the study goal, how close they felt to achieving the goal while pursuing it, causal attributions and responsibility, the level of effort, productivity, and control participants experienced during goal pursuit, a grade prediction, the likelihood of future planning, and for participants in the planning conditions, whether their plan made it easier or harder to achieve the goal, and how closely participants followed the plan,. In Wave 3, participants completed measures of whether they followed through on their planned actions (though due to an error this measure was inconsistent across conditions), their feelings about their goal, plans, grade, and actions after receiving their grade, counterfactual judgments after receiving their quiz grade, their closeness to earning a good grade, attributions regarding their grade, how their grade compared to their ideals and expectations, the difficulty of the quiz, their usual planning and study habits, and demographics.

**APPENDIX 1.3: INDIRECT EFFECTS OF ADDITIONAL EMOTIONS FOR IF-THEN /  
CONTROL PLANNED CONTRAST – STUDY 2**

<b>Negative emotions (<math>\alpha = .93, n = 234</math>)</b>	<b>Positive emotions (<math>\alpha = .84, n = 235</math>)</b>
$\beta = .0261, \text{LLCI: } .0036, \text{ULCI: } .0683 *$	$\beta = .0058, \text{LLCI: } -.0050, \text{ULCI: } .0351$
Sad Regretful Angry with myself Guilty Ashamed Disappointed Unlucky Frustrated	Happy Enthusiastic Proud Hopeful

Analyses conducted with 10,000 bias-corrected bootstrapped samples and the same inclusion criteria as the main analyses. Sample sizes differ slightly between measures because of omitted responses for the listed items.

## APPENDIX 1.4: ITEMS INCLUDED IN SERIAL MEDIATION MODEL - STUDY 3

### Goal intentions ( $\alpha = .90$ ; all 7-pt scales, anchors noted below)

- How strong is your desire to achieve your E! personal exercise time goal? (“No desire at all”/“Extremely strong desire”)
- Agree or disagree with the following statement (both “Strongly disagree”/“Strongly agree”)
  - "I want to achieve my personal exercise time goal"
  - "I have decided that I will try hard to achieve my personal exercise time goal"
- How strong is your actual intention to achieve your E! personal exercise time goal? (“No intention at all”/“Extremely strong intention”)

### Action monitoring (1 = “not at all well,” 7 = “very well”)

- Overall, how well did you overcome obstacles that prevented you from exercising during the period of [Week 3]?
- Overall, how well did you carry out all the steps that you needed to do in order to exercise during the period of [Week 3]?

### Regret (0 = “not at all,” 3 = “moderately,” 6 = “very much”)

Think about how you feel regarding the amount of time that you exercised when you were working toward your personal exercise time goal during the period of [Week 3]. How well do the following statements describe your feelings? (“Regretful” listed with “satisfied,” “fulfilled,” “happy,” “wishing I could change the situation,” and “determined to improve in the future.”)

### Outcome expectancies (0 = “0% chance,” 100 = “100% chance”)

Using the slider below, give your best prediction for whether you will exercise for enough time to achieve your personal exercise time goal during the period of [Week 5]. If you predict that you have a small chance of achieving your goal, slide the bar to the left. If you think you have a large chance of achieving your goal, slide the bar to the right. Slide the bar more toward the middle to reflect a moderate chance of achieving your goal.

In addition to the measures described above, in Appendix 1.6, and in the main body of the paper, during Wave 1 participants also completed items about the likelihood of changing their future goals, the date that they predicted they would achieve their goal, an estimate of the amount of time they would need to do ancillary activities to prepare to exercise, causal attributions, their experience with and enjoyment of exercising, and demographics. During Wave 2, participants completed measures on whether they had changed their goals in the online tracker, their reasons for doing/not doing so, the likelihood of changing future goals, their judgment of how completely they had achieved their goal, the ease of generating counterfactuals, their satisfaction

and expectation disconfirmation for their exercise performance, causal attributions, global/specific thinking, a prediction of the date when future goals would be achieved, self-efficacy, and an estimate of the amount of time they would need to do ancillary activities to prepare to exercise.

**APPENDIX 1.5: INDIRECT EFFECTS OF ADDITIONAL EMOTIONS FOR IF-THEN /  
CONTROL PLANNED CONTRAST – STUDY 3**

Wishing I could change the situation ( <i>n</i> = 498)	$\beta = -.1266$ , LLCI: -.4961, ULCI: -.0099 *
Determined to improve ( <i>n</i> = 496)	$\beta = .0038$ , LLCI: -.0476, ULCI: .0758
Fulfilled ( <i>n</i> = 495)	$\beta = .0748$ , LLCI: -.0353, ULCI: .5128
Happy ( <i>n</i> = 497)	$\beta = .0390$ , LLCI: -.0830, ULCI: .4242
Satisfied ( <i>n</i> = 497)	$\beta = .0404$ , LLCI: -.0892, ULCI: .4388

All analyses conducted with 10,000 bias-corrected bootstrapped samples, baseline exercise minutes and initial goal intentions as covariates, and the same inclusion criteria as the main analyses. Sample sizes differ slightly between measures because of participants who omitted responses for the listed emotions.

## APPENDIX 1.6: ANALYSIS OF SUPPLEMENTARY VARIABLES – STUDY 3

We also conducted a series of supplementary analyses on variables not included in the main model to gauge the generality of the findings in Study 3. First, we substituted the dependent measure (minutes exercised in Week 5, a behavioral measure) for the goal intentions that participants reported in reference to Week 5. While we felt that behavior was a more illuminating measure of the dynamic of goal pursuit, stated future goal intentions provide some additional information and further continuity with Study 2, where we did not have a behavioral measure for the participants' opportunity to act. Using future goal intentions as the dependent measure yielded substantively identical results for the indirect path in the serial mediation model. The wording of the goal intention items was the same as found in APPENDIX 1.3 and they again demonstrated good internal consistency ( $\alpha = .90$ ). Four hundred ninety-five participants are included in this analysis as not all participants answered all of the future goal intentions items. As before, baseline exercise minutes and initial goal intentions were included as covariates in the model. We will focus on the results for the if-then/control comparison below, as again when-where-how respondents yielded a non-significant indirect path. If-then participants reported executing steps/coping with obstacles less well than participants who did not set a plan ( $\beta = -.19$ ,  $t(489) = -2.08$ ,  $p = .04$ ). This led them to feel more regret over their performance ( $\beta = -.56$ ,  $t(488) = -14.29$ ,  $p < .001$ ), which caused if-then planners to report a reduced likelihood of achieving their exercise goal for Week 5 ( $\beta = -2.58$ ,  $t(487) = -5.44$ ,  $p < .001$ ). In turn, these expectancies reduced goal intentions for Week 5 ( $\beta = .02$ ,  $t(486) = 8.64$ ,  $p < .001$ ). The indirect path was significant ( $\beta = -.0058$ , LLCI:  $-.0162$ , ULCI:  $-.0009$ ). The direct effect did not approach significance ( $\beta = -.0036$ ,  $t(486) = -.08$ ,  $p = .94$ ). Analysis of the moderating role of experience again revealed a significant interaction between experience and regret ( $\beta = .35$ ,  $t(485) = 2.40$ ,  $p =$



.02) in a regression with outcome expectancy as the dependent variable, and a significant relationship between outcome expectancy and goal intentions ( $\beta = .02$ ,  $t(486) = 8.64$ ,  $p < .001$ ). Analysis of the conditional indirect effect revealed that regret significantly reduced outcome expectancies and in turn future goal intentions for participants 1 SD below mean experience ( $\beta_{1SD} = -.0772$ , LLCI =  $-.1270$ , ULCI:  $-.0406$ ), and at the mean level of experience ( $\beta_{MEAN} = -.0547$ , LLCI =  $-.0946$ , ULCI:  $-.0261$ ). As earlier, participants 1 SD above the mean level of experience yielded a non-significant path between these variables ( $\beta = -.0322$ , LLCI:  $-.0791$ , ULCI:  $.0077$ ). However, the confidence interval for the index of moderated mediation for the entire indirect path included 0 ( $\beta = .0075$ , LLCI:  $-.0005$ , ULCI:  $.0176$ ). Thus, while the relationship between regret and outcome expectancy was again altered by experience (as noted by the presence of the significant interaction) and the pattern of conditional indirect effects also matches those found in the main analyses, the presence of 0 in the confidence interval for the index of moderated mediation indicates that we cannot definitively conclude that the conditional indirect effects for the path between regret, outcome expectancy, and future intentions are different from each other at all levels of the moderator. Indeed, one might expect a somewhat weaker pattern of results for intentions as opposed to behavior, as people's intentions are often miscalibrated compared to how they actually behave (indeed underscoring our desire to collect behavioral data in this study).

Second, we substituted two measures for the outcome expectancy variable. Participants were also asked to predict the number of minutes they would exercise in Week 5 ("How many minutes do you predict that you will exercise during the period of [Week 5]") and their confidence in their ability to meet their Week 5 goal ("Agree or disagree with the following statement: 'I am confident that I can exercise for enough time to achieve my personal exercise

time goal during the period of [Week 5]”; 7 = “strongly disagree”, 1 = “strongly agree”). As a reminder, the outcome expectancy measure asked participants to judge the probability on a 1-100% scale of their likelihood of achieving the future goal. While these measures are related to the outcome expectancy variable in the model, they are also somewhat different. The minutes prediction is a more deterministic (as opposed to probabilistic) judgment, and the confidence item measures a judgment that is more affective or feelings-based. Both substitute items yield similar results to our measure of outcome expectancy. Both analyses below again control for baseline exercise minutes and initial goal intentions to match the main set of results. Once more, we focus on the if-then condition as the when-where-how condition did not yield a significant indirect path for either substitute measure.

For the predicted minutes variable, 499 responses were available for analysis. We Winsorized participants’ responses using the same procedure described in the main set of analyses. If-then participants judged that they did a worse job at enacting steps and carrying out obstacles compared to control ( $\beta = -.18$ ,  $t(493) = -2.06$ ,  $p = .04$ ), which caused them to feel more regret ( $\beta = -.56$ ,  $t(492) = -14.32$ ,  $p < .001$ ). In turn, this regret led to a decrease in the number of predicted exercise minutes for Week 5 ( $\beta = -6.73$ ,  $t(491) = -1.93$ ,  $p = .05$ ) and this prediction was associated with fewer minutes exercised in Week 5 ( $\beta = .59$ ,  $t(490) = 11.83$ ,  $p < .001$ ). As in the model with outcome expectancy, the indirect path was significant ( $\beta = -.4016$ , LLCI: -1.2872, ULCI: -.0197). However, unlike with outcome expectancy, experience did not moderate the link between regret and minutes predicted. The interaction of the experience variable and regret was not significant ( $\beta = -1.03$ ,  $t(489) = -.96$ ,  $p = .33$ ) and the confidence interval for Hayes’ index of moderated mediation included 0 ( $\beta = -.6027$ , LLCI: -1.9930, ULCI: .5153). Thus, predicted minutes of future exercise had the same effect as our outcome expectancy variable in the effect

of if-then plans over time, replicating the main set of analyses. However, the moderating role of experience on the impact of regret did not materialize. Indeed, it seems somewhat easier for novice participants to be able to judge their future likelihood of success versus the number of minutes they will exercise as the probabilistic judgment is more constrained and seems less subject to miscalibration.

Finally, we substituted participants' judgments of confidence in place of the outcome expectancy measure. Four hundred ninety-six participants were available for analysis due to three participants who did not complete the confidence item. Again, setting an if-then plan led participants to judge that they did a worse job at enacting steps and coping with obstacles ( $\beta = -.18$ ,  $t(490) = -2.04$ ,  $p = .04$ ), which led participants to feel more regret ( $\beta = -.55$ ,  $t(489) = -14.25$ ,  $p < .001$ ). Regret was associated with lower confidence ( $\beta = -.08$ ,  $t(488) = -2.89$ ,  $p < .01$ ), which resulted in fewer minutes exercised ( $\beta = 15.68$ ,  $t(487) = 2.34$ ,  $p = .02$ ). The indirect effect for if-then planners was significant ( $\beta = -.1332$ , LLCI:  $-.6584$ , ULCI:  $-.0063$ ). Turning to the moderating role of experience in the relationship between regret and confidence, an interaction between regret and experience emerged ( $\beta = .02$ ,  $t(486) = 1.95$ ,  $p = .052$ ) and the effect of confidence on Week 5 exercise minutes was significant ( $\beta = 15.68$ ,  $t(487) = 2.34$ ,  $p = .02$ ). The pattern of conditional indirect effects matched the main analyses for outcome expectancy, with novices 1 SD below the mean of experience yielding a significant effect of regret on confidence and minutes exercised ( $\beta_{-1SD} = -2.09$ , LLCI:  $-5.2132$ , ULCI:  $-.4801$ ), as well as participants at the mean level of experience ( $\beta_{MEAN} = -1.27$ , LLCI:  $-4.0746$ , ULCI:  $-.0634$ ). This path was not significant for high-experience participants 1 SD above the mean ( $\beta_{+1SD} = -.4597$ , LLCI:  $-3.7165$ , ULCI:  $1.0589$ ). However, the confidence interval for the index of moderated mediation included 0 ( $\beta = .2729$ , LLCI:  $-.0267$ , ULCI:  $.8194$ ), indicating that it is not possible to

conclusively determine that all levels of experience on the indirect path are significantly different from each other. Thus, again we see similar results for the role of confidence as for outcome expectancy. In the serial model examining the role of action monitoring, regret, and confidence on Week 5 exercise minutes, the substantive effect of the indirect path matches across the two analyses. With regard to the moderating role of experience, the constituent path between regret and confidence is again altered by experience. However, because the confidence interval for the index of moderated mediation includes 0, we cannot definitively conclude that the conditional indirect effects for the path between regret, confidence, and minutes exercised are different from each other at all levels of the moderator.

The results of these supplementary analyses indicate good support for the generality of the serial model linking planning to future outcomes. Analysis of the serial mediation model yields very similar patterns using a different dependent measure (future intentions) and a set of different mediators (predicted minutes exercised and confidence in place of outcome expectancy). The results showing the generality of how experience moderates the role of regret are somewhat more difficult to interpret. While the variables examined in this supplementary analysis are similar to those under primary investigation, they also differ in potentially important ways (e.g., probabilistic v. deterministic judgments, more v. less feelings-based). We continue to investigate the role of these differences in ongoing work.

## **CHAPTER 2: PLANNING AND PREDICTION**

### **INTRODUCTION**

Many studies have demonstrated that implementation intentions have a profound impact on goal achievement. In a variety of contexts ranging from consequential “real life” tasks like vaccination and cancer screening programs (Orbell, Hodgkins, and Sheeran 1997; Milkman et al. 2011) to laboratory-based tasks like pushing a button quickly (e.g. Brandstätter, Lengfelder, and Gollwitzer 2001), a broad base of work has shown that setting plans helps people to be more likely to successfully attain their goals.

Implementation intentions are postulated to work by forging connections between goal intentions, situational cues and desired behaviors. Gollwitzer (1999) reviews three mechanisms that contribute to the effectiveness of these plans. First, implementation intentions make situational cues more salient, such that individuals are more likely to notice when they should act in service of the goal; second, they strengthen the cognitive association between goal-consistent situations and actions, and; third, implementation intentions eliminate the need to deliberate “in the moment” about what action should be undertaken. Together, these mechanisms contribute to a more automatic execution of behavior when the appropriate situation is encountered by the individual.

For example, consider an aspiring exerciser who has decided to pursue an exercise goal and is making a plan to achieve that goal. While walking out the front door of her home on the

way to work, she may say to herself, “I will stop in to the gym for a workout on my way home from work today at about 5:00.” When indeed she does drive by the gym on her evening commute, she should be more likely to say to herself, “Oh right, I was going to exercise this evening,” and to simply do so without needing to think “in the moment” about whether such an action is necessary or beneficial.

Inherent in this mechanism is that plans should be most effective when people are good predictors. By their very nature, making plans induces people to look toward the future; they must anticipate circumstances when acting in service of the goal would be beneficial, and decide how they will act when it is time to execute those actions. Because plans work by forming a bridge between situational cues and actions, they should work best when people are able to accurately foresee the events that they will encounter, how they will act, and how they will feel. Returning to the exercise example, our exerciser’s plan is likely to be less effective if she does not anticipate that she will be taking a different route home that does not cause her to pass by the gym, or that the demands of her job are likely to require the need to stay late at the office.

However, we know from prior research that people are often bad forecasters for both their future actions and for the outcomes that result from them. They tend to be overly optimistic, believing that they will act in ways consistent with their intentions and that negative results mainly happen to other people (Weinstein 1980; Armor and Taylor 1998; Koehler and Poon 2006). They become blinded to risks that stand in their way once they start to pursue goals (Taylor and Gollwitzer 1995). They believe they will efficiently carry out tasks in support of their objectives, but are too optimistic about getting things done on time (Buehler et al. 1994), and they often are far off the mark when anticipating the strength and duration of their feelings (Wilson and Gilbert 2003).

Despite people's poor track record at forecasting, plans often facilitate goal achievement. Do plans work in spite of our poor ability to make predictions about the future, or do plans also influence the forecasts that we make? It seems possible that, by guiding people to explicitly consider a broader range of possible circumstances that they will face during goal pursuit (specifically, obstacles), plans may influence the optimism of forecasts and help to improve their accuracy by providing a more complete picture of the road ahead. However, little work to date has examined the impact of planning on prediction. Alternately, plans may also focus people on a narrow slice of events that does not reflect reality or lead to negative outcomes like rumination, causing their forecasts to be less accurate and less optimistic.

In this paper, we explore how the type of implementation intentions that people set influences the predictions that they make about their future goal pursuit. We examine forecasts formed after setting different types of plans which have been commonly used in the literature – if-then and when-where-how plans. The forecasts that we investigate are in three domains: the presence of future circumstances and actions (i.e. “What situations will happen as I am pursuing my goal and how will I act when I encounter them?”), the duration of time that a task will take, a forecast which is often referred to as the planning fallacy (i.e. “When will I achieve my goal?”), and future emotions relating to goal progress (i.e. “How will I feel as I am pursuing my goal?”).

Examining these questions is important from both a theoretical and practical standpoint. Little is currently known about the relationship between planning and forecasting, despite the fact that such knowledge would increase our understanding of the mechanisms behind why plans make it more or less likely that people achieve goals. For example, plans that accurately predict the range of situations that individuals are likely to encounter should stand the best chance of

being successfully enacted. It is also possible that individuals who anticipate feeling very positive or negative during goal pursuit will be better prepared to grapple with emotions resulting from setbacks, resulting in a lower chance of disengaging from the goal. Finally, plans which help people to form more accurate time predictions may allow individuals to build in “slack” into their goal pursuits, such that deadlines, etc. are more easily accommodated.

## **THEORETICAL BACKGROUND**

### *Obstacles? What obstacles?*

People very often make predictions about the future through rose-colored glasses. In contrast to their memories of the past, which are often tinted with a mix of positive and negative construals, people’s outlook on their future actions and outcomes is very frequently positively biased (Armor and Taylor 1998; Ross and Newby-Clark 1998; Dunning 2007). People expect that they will do good things, and that as a result, good things are likely to happen to them. For instance, participants in Weinstein’s (1980) seminal study believed that they were far more likely than their peers to experience positive events like enjoying their job or owning their own home, and far less likely than their peers to fall prey to negative outcomes like developing a drinking problem or getting a divorce. Similarly, people also predict that they will be more likely to carry out desirable actions like donating blood (Koehler and Poon 2006), saving money (Koehler, White, and John 2011), and contributing to charity (Balcetis and Dunning 2008). Further, people also believe that they will act to reach goals in an efficient and timely manner – research on the planning fallacy demonstrates that individuals routinely underestimate the amount of time that it will take them to complete tasks. Perhaps the most famous (and expensive) manifestation of this rosy view is the construction of the Sydney Opera House, which was scheduled to open in 1963 but did not welcome its first concert-goer until ten years later, after more than \$95 million in



additional costs had been spent on construction (Buehler et al. 1994). Finally, people frequently exhibit biases in forecasting their future feelings, particularly in estimating the intensity and duration of how they will feel later on (for reviews, see Loewenstein and Schkade 1999; Wilson and Gilbert 2003). While these types of predictions are less uniformly rosy – for example, people have a strong tendency to neglect their ability to cope with future negative outcomes (Gilbert et al. 1998) – there is evidence that optimism pervades under certain conditions (e.g. Buehler and McFarland 2001; Liberman, Sagristano, and Trope 2002; Wilson and Gilbert 2003).

A frequently proposed explanation for these biases is that individuals rely on constructing plausible narrative scenarios in order to make forecasts. In other words, when asked to make a prediction, a common response is to engage in mental simulation and come up with a story for the chain of events that one expects will happen (Kahneman and Lovallo 1993; for a review, see Dunning 2007). So, for example, if a prospective exerciser is evaluating the amount of time he expects to visit the gym over the next month, he may picture himself conveniently stopping in for a workout on the way home from the office, the efficiency he will have as he progresses through his workout routine with purpose and vigor, and the energizing endorphins he will feel as the workout concludes. Such a process is often called an “inside approach,” in that it relies on the generation of a prediction based on features of the situation at hand. In contrast, individuals could also take into account an “outside approach” by incorporating other information external to the current problem like thinking back to past times when similar behavior has occurred, base rates for success, etc. (Kahneman and Lovallo 1993). Despite the fact that the past is often the best evidence for what will happen in the future, forecasters typically rely quite heavily on the narratives they construct using the inside approach (Kahneman and Lovallo 1993; Buehler et al. 1994; Armor and Taylor 1998; Buehler and McFarland 2001; Balcetis and Dunning 2008)

While the inside approach is an easily-accessible tool to reach for when faced with the need to make a forecast, its effective use is often difficult in practice. Foreseeing a complete and accurate view of the future is a colossal task, and as a result, the scenarios that people construct are typically incomplete (Kahneman and Lovallo 1993; Dunning 2007). Specifically, individuals tend to construct scenarios that are too simple, focusing on a single idealized chain of events where all events unfold as intended, and neglecting the possibility that something could go wrong (Buehler et al. 1994; Armor and Taylor 1998; Buehler and McFarland 2001; Dunning 2007; Balcetis and Dunning 2008; Tanner and Carlson 2009; Koehler et al. 2011). For example, Buehler et al (1994) asked participants to predict when they would achieve a goal to finish an upcoming academic assignment and to think aloud while doing so. Over 70% of the thoughts generated were about future facilitative actions in service of the goal, and only 3% dealt with future problems that might arise. Weinstein (1980) similarly found that participants were able to generate many more reasons why they would reach positive outcomes (versus fall short of good outcomes) and many more reasons why they would avoid negative scenarios (versus fall prey to them).

Thus, when they look toward the future and simulate what will happen, people often do so by imagining the path from start to finish will be straightforward and unencumbered. However, while people are optimistic, their forecasts remain grounded in reality and are open to malleability – Armor and Taylor (1998) describe a “situated optimist” who bases his expectations for the future on scenarios that seem to parsimoniously describe what might happen with events that are compelling and easy to imagine, but that remain grounded in some understanding of reality. The problem is that people rarely plan to fail, so hindrances and obstacles are rarely given consideration when considering how the future will unfold (Armor and

Taylor 1998; Dunning 2007). Indeed, interventions that help break people away from their disproportionate focus on a straightforward future – for example, asking them to make forecasts for other people, encouraging the consideration of “worst-case scenarios,” contrasting predictions against what would happen in an “ideal world,” changing the time frame at hand, or prompting forecasters to “unpack” tasks into multiple component parts – are often successful at inducing less optimistic forecasts (Newby-Clark et al. 2000; Buehler and McFarland 2001; Kruger and Evans 2004; Dunning 2007; Balcetis and Dunning 2008; Tanner and Carlson 2009; Peetz, Buehler, and Wilson 2010).

### *Plans and forecasting*

As such, a contributing driver behind optimistic forecasts seems to be that people think too narrowly about the relatively small range of steps they expect to take in order to successfully achieve a goal, and not enough about what to do in case of alternate scenarios like problems that could stand in their way. Thus, might different types of plans that change the likelihood of considering obstacles also affect the forecasts that people make?

Above, we have described how people set forecasts by building simulations or narratives for how they expect the future to unfold. Research demonstrates that planning is also connected to the process of scenario-building. For example, Hayes-Roth and Hayes-Roth (1979) argue that mental simulations provide the basis to identify the actions that need to be carried out and the constraints faced in the execution of the goal, and they thus serve as an input to form and revise comprehensive plans. Indeed, when people envision the actions or the process that they will need to take in order to reach a goal, it enhances the likelihood that they engage in planning, resulting in better performance. The benefits of this simulation seem to accrue from thinking about specific actions, as picturing the desired outcome did not result in similar improvements (Taylor

et al. 1998; Pham and Taylor 1999). Recently, Masicampo et al. (2015) proposed that mental simulation underlies the effectiveness of implementation intentions, demonstrating that both plans and simulations help people to achieve goals but that the combination of the two strategies did not yield additional benefits beyond using one alone. Further, when participants' ability to accurately simulate the task was impeded, the helpful effect of plans was eliminated. Finally, additional evidence linking scenario-building and planning comes from the literature on mental contrasting (for reviews, see Oettingen 2012; Oettingen, Wittchen, and Gollwitzer 2013). This strategy induces participants to compare the reality of their current situation with their desired outcome, which prompts both increased motivation and the identification of the means required to bridge the gap between the present reality and the wanted end-state. Specifically, when expectations for success are high, mental contrasting helps individuals to recognize elements of their current situation that hinder goal pursuit as obstacles and highlights that action is necessary to overcome them. Recent work (e.g. Adriaanse et al. 2010; Oettingen et al. 2015) has shown that combining planning and mental contrasting results in improved efficacy compared to using either strategy on its own (particularly when it is difficult for planners to anticipate the future), revealing the synergy of the two processes. Thus, these findings in combination suggest a strong association between planning and developing a simulation or narrative of the future.

We build upon this body of work by asking a related but distinct question. Rather than evaluating whether the effect of future action is enhanced or diminished by the planning and/or simulation, we posit that the act of setting different types of plans changes the narratives that people construct. In the previous chapter, we described two types of plans that have been commonly and mainly interchangeably used in the implementation intentions literature – if-then and when-where-how plans. Recall that we argued if-then plans are contingent and reactive –

they guide the planner to start with a situation that they might encounter, and then to specify an action to take in response. In contrast, we maintain that when-where-how plans are more proactive. Rather than waiting for a situation to occur, they start with a desired action and then direct the participant to specify supporting details of when, where, how, and for how long that action will be carried out.

Importantly, in Study 1 of the previous chapter, we demonstrated that these differences in format led to differences in the type of plan that is formed. Building upon the work of Sniehotta and his colleagues (e.g. Sniehotta et al. 2005), we distinguished between plans intended to specify facilitative steps to reach the goal and plans that outline means to cope with obstacles. Specifically, we found that participants who formed if-then plans were more likely to bring to mind obstacles that required a coping response (what we called “coping plans”), while when-where-how planners were more likely to think about facilitative steps to reach the conclusion of the goal (what we called “step plans”).<sup>9</sup> Returning to the exercise example, an if-then planner might be more likely to think, “If the weather is bad when it’s time to go for a run then I will go to the gym instead,” while a when-where-how planner might lay out a plan like, “I will go to the gym this evening by driving there on my way home from work. It should take me about 40 minutes.” Thus, it seems possible that the type of plan that an individual forms may influence forecasts by guiding the degree to which facilitative steps or means to cope with obstacles are included in the narrative used to construct the forecast.

### *Hypotheses*

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<sup>9</sup> Note that by using the term “steps” we intend to distinguish actions which facilitate progress toward the goal rather than cope with obstacles. We do not mean to imply that the individual necessarily lays out a series of actions in a particular sequence.

In sum, people make forecasts about what will happen during goal pursuit, how they will feel as the goal is underway, and when it will reach a successful conclusion by constructing mental simulations of what they expect will happen. Most frequently, those simulations consist of a compelling narrative that is focused almost exclusively on how to proceed toward the goal, and very rarely on problems that might stand in the way. Because plans change the nature of the situations and actions that people consider when they pursue the goal they are also likely to change their forecasts. This leads to two sets of competing general predictions:

On the one hand, by highlighting obstacles that people would otherwise not consider, if-then plans may lead to more comprehensive narratives – people will be more likely to predict what will actually happen in the future – and in turn they will generate less optimistic and more accurate forecasts. Conversely, when-where-how plans, which increase the salience of facilitative steps, should strengthen people’s natural tendencies to only focus on what they will do to succeed at the goal, leading to more extreme predictions and less accurate forecasts.

On the other hand, two alternate possibilities also exist, depending on the type of forecast at hand. First, when they are asked to predict the events that will unfold in the future, if-then planners who are focused on obstacles may in fact be less accurate. Because coping with obstacles requires a reaction to some barrier (be it either an internal barrier like motivation or an external stimulus like the weather), the likelihood of needing to carry out the plan is probabilistic – if the obstacle never occurs, there is no need to cope by carrying out the plan. In contrast, plans which lay out facilitative steps for how to progress toward the goal are often under greater volitional control. As an example, consider an exerciser who makes a plan for how to exercise even when the weather is inclement and another fitness buff who plans to go to the gym every evening at 5:00 pm. If the weather is consistently beautiful, the individual who planned to cope

with rainy skies and driving winds will never have the opportunity to execute his or her plan. However, 5:00 pm will always arrive every day, so the opportunity to carry out the step of going to the gym at that time will always be available. Thus, individuals who set if-then plans focused on obstacles may in fact generate less accurate forecasts. This scenario seems particularly likely for planners who do not have much experience with the goal at hand – accurately forecasting problems which may arise is often challenging for individuals pursuing new and uncertain goals (Sniehotta et al. 2005). Second, when they are asked to predict the amount of time that a task will take or how they will feel in the future, if-then planners may also be more optimistic if their plans for how to cope with problems generate a feeling of confidence or greater certainty – thoughts like, “Well now I know what to expect and how to deal with these challenges,” for example.

In this paper, we examine forecasts in three different ways. First, we directly ask whether people who form certain types of plans are better or worse at anticipating the events that will arise during goal pursuit and how they will act during those opportunities. In other words, did the plan that an individual formed accurately reflect the realities of what occurred as they were pursuing their goal and did the individual carry out the action that was planned? Was their narrative indeed comprehensive? Second, we explore the influence of plan format on the task time predictions (i.e. the planning fallacy). Finally, we examine whether plan format influences the prediction of future feelings.

## **STUDY 1: PREDICTIONS FOR FUTURE EVENTS**

In order to make plans, people must form predictions of what they think will happen in the future; they must evaluate which goal-consistent opportunities that they expect to arise and work out an action that seems feasible to carry out in such a scenario. In this study, we sought to examine the degree to which different types of plans reflect the reality of goal pursuit – in other words, do the scenarios that people plan to encounter as they pursue their goal actually arise, and do they carry out the actions that they have planned to execute? As we have argued above, planning and forecasting are closely linked. Thus, while we did not explicitly direct participants to make forecasts, the opportunities and actions they that consider as part of the process of planning should represent the ways in which they expect the future to unfold while pursuing the goal.

Plan type could affect the accuracy of plans in multiple ways, leading to a set of competing hypotheses. As described above, setting if-then plans, which focus individuals more intently upon how to cope with obstacles, may lead participants to think about problems that would have otherwise gone unconsidered, increasing the likelihood that their plans will reflect actual events. In contrast, if their plans are somewhat inflexible and focused on a narrow set of events that never occurs, if-then planners could be more likely to form plans that are a relatively inaccurate depiction of future goal pursuit, leading to time and effort spent preparing for events that never materialize.

Further, we expected that the task of figuring out which opportunities and actions will occur in the future would be easier for some participants than others. Specifically, it is easier to know what to expect of the future if one has learned from experiencing similar situations and carrying out (or failing to carry out) corresponding behaviors in the past, particularly when trying



to anticipate obstacles (Sniehotta et al. 2005). Thus, we expected that greater experience would reduce differences in accuracy between if-then and when-where-how planners.

### *Participants and Method*

Participants were drawn from “Exercise!” (“E!”; the name of this program is disguised for confidentiality), a physical fitness program at a large U.S. university. Participants tracked the number of minutes that they engage in physical exercise over a 6-week period and entered their results into a tracking website. To this program, we added an experiment where participants completed one of three planning interventions (or were assigned to a no-plan control condition). All participants were invited to participate in the study via an email invitation. To maintain consistency with the sample for our hypotheses examined in Chapter 1, Study 3, we used the same participant inclusion criteria as described there. However, because control participants were not asked to form plans, they were not included in the analysis for this study, leaving 367 participants remaining.

In Week 2 of the E! program, participants were randomly assigned to one of four conditions. In the control condition, participants did not receive any guidance from us on forming plans and carried out their exercise routine naturalistically. In the if-then condition, participants first saw instructions and an example of two if-then plans for an unrelated healthy eating goal and they then outlined one to four obstacles that could arise as they were working toward their E! exercise goal. Participants then completed each plan by specifying a matching action that they would take to cope with the obstacle. In the when-where-how condition, participants saw instructions and a corresponding healthy eating example in that format and then laid out one to four actions that they could take to pursue their E! exercise goal. They then completed each plan by generating when, where, how, and for how long they would carry out

each step. We also administered a third experimental condition – hybrid plans – as an exploratory investigation to create a new planning format to encourage participants to think about both how to proceed toward the goal and how to cope with obstacles, as well as to encourage interdependent consideration of the elements of the plan. Because this format was exploratory, we did not have *a priori* predictions for how it would affect prediction, so we will not further discuss this condition for the rest of this paper. During Week 4 of the study, participants received a follow-up questionnaire including the dependent measure at hand. Participants were reminded of their plans and for each they were asked to indicate whether over the course of the past week (a) they had the opportunity to carry out this part of their plan, and (b) whether they actually did so. Participants indicated their answer to each question by clicking check boxes next to each plan statement. Thus, we can determine the accuracy of participants' predictions for the scenarios that will arise during goal pursuit and for execution of their intended response. As a measure of experience, participants also indicated the number of times they have participated in the E! program.

### *Results*

Upon initial examination of the data, we noted that some participants had indicated that they had carried out an element of their plan while leaving the box unchecked indicating they had the opportunity to do so. Of course, in order to act, one must have also had the opportunity to do so. Thus, we recoded the opportunity measure to indicate that the opportunity to act was present if the plan was executed. We then counted the number of plans generated by each participant and adjusted counts to reflect duplicates or invalid responses. Finally, for each participant we calculated the proportion of plans where the participant indicated (a) the planned opportunity to act arose, and (b) the plan was carried out. Because the dependent variable is a

proportion bounded by 0 and 1, prior to analysis, proportions were transformed using an arcsine-root transformation as outlined by Sokal and Rohlf (1995).<sup>12</sup> For interpretability, the means presented below are untransformed, while statistical tests incorporate the transformed dependent variable. To account for heterogeneity in participants' commitment to the E! program and to exercising, we controlled for goal intentions using the measures described in Chapter 1, Study 3.

Overall, step plans made by participants in the when-where-how condition were a better reflection of the actual events that occurred during goal pursuit than the coping plans made by participants in the if-then condition. When-where-how planners had the opportunity to carry out 92% of their plans ( $SD = .19$ ) while if-then planners reported that they had the chance to carry out 88% of theirs ( $SD = .25$ ). However, a regression indicated that this difference did not reach significance ( $\beta_{\text{OPPORTUNITY}} = -.04$ ,  $t(363) = -1.62$ ,  $p = .11$ ). When-where-how planners were also more likely to execute their intended actions, reporting that they carried out their plans 69% of the time ( $SD = .35$ ). If-then planners were less successful, carrying out 62% of their plans ( $SD = .32$ ). This difference also approached but did not reach significance ( $\beta_{\text{ACTION}} = -.05$ ,  $t(363) = -1.63$ ,  $p = .10$ ).

Thus, returning to our competing hypotheses, these initial results are suggestive but not significantly supportive of our second prediction. It seems that the probabilistic nature of the obstacle-focused coping plans formed by participants in the if-then condition led them to form plans that were less likely to reflect what actually happened during goal pursuit. Conversely, when-where-how planners, who formed plans about steps to get from the start of the goal to the

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<sup>12</sup> We also examined results using a log-transformed DV and a generalized linear model with a logit link function and binomial variance function (including robust standard errors), as recommended by the UCLA Statistical Consulting Group (n.d.). All methods of analysis yielded similar substantive conclusions; for brevity we present those using the arcsine-root transformation.

finish, were more likely to have had the chance to put their plans into action, and were more likely have to actually done so.

However, recall that experience should also play a role in the ability to accurately predict what will happen during goal pursuit. When the goal is new, figuring out what events are likely to happen is a tough prospect, but with experience, individuals should have a better understanding of the scenarios they are likely to encounter and the likelihood that their plans can be successfully executed, particularly for how to cope with obstacles (Sniehotta et al. 2005). We predicted that relative novices would show the greatest gap in predictive accuracy, while the benefit of experience would even out differences between forming coping-focused if-then plans and step-focused when-where-how plans. To test this prospect, we conducted a moderation analysis with the number of prior times respondents had previously participated in the E! program entered in the model as a moderator. Participants reported having previously participated in E! between 0 and more than 10 times.

First, experience moderated the likelihood of selecting plans where the opportunity to act arose during goal pursuit. The interaction between experience and planning condition was significant ( $\beta = .02$ ,  $t(360) = 2.18$ ,  $p = .03$ ). If-then planners 1 SD below the mean for experience were significantly less likely to generate plans that they eventually had the chance to enact, compared to when-where-how planners ( $\beta_{-1SD} = -.08$ ,  $t(360) = -2.68$ ,  $p = .01$ ), while participants at the mean level of experience displayed the same pattern with marginal significance ( $\beta_{MEAN} = -.04$ ,  $t(360) = -1.67$ ,  $p = .096$ ). No significant difference between planning modes emerged for participants at 1 SD above the mean level of experience ( $\beta_{+1SD} = .01$ ,  $t(360) = .35$ ,  $p = .73$ ).

Second, the same pattern of results arose when considering the proportion of plans that participants actually carried out. Again, the interaction between experience and planning condition was significant ( $\beta = .03$ ,  $t(360) = 3.25$ ,  $p = .001$ ). If-then planners 1 SD below the mean experience level were significantly worse at enacting their plans versus when-where-how planners ( $\beta_{-1SD} = -.15$ ,  $t(360) = -3.47$ ,  $p = .001$ ), while participants at the mean level of experience displayed the same pattern at a marginal level of significance ( $\beta_{MEAN} = -.05$ ,  $t(360) = -1.74$ ,  $p = .08$ ). No significant difference between plan types emerged for participants at 1 SD above the mean level of experience ( $\beta_{+1SD} = .05$ ,  $t(360) = 1.07$ ,  $p = .29$ ).

### *Discussion*

In this study we examined the accuracy of participants' forecasts for planned future events and actions. In other words, did participants actually encounter the events that they laid out in their plans, and when given the opportunity to act, did they actually do what they thought they would do?

Our *a priori* predictions for this question were mixed. On one hand, if-then plans focused on how to cope with obstacles could help broaden the scope of participants' narratives for how goal pursuit would unfold, prompting them to consider scenarios and actions that would have otherwise gone unnoticed. On the other hand, the presence of obstacles is more probabilistic than steps to get from point A to point B; in a volatile environment, individuals likely have less control over whether they will need to put their plan to use because the obstacle they have in mind may or may not materialize and over whether their planned actions are indeed appropriate for the specific barrier that arises.

These results suggest that our latter prediction rings more true. Compared to step-focused when-where-how plans, thinking about how to cope with barriers in the if-then condition led to fewer opportunities to carry out one's plan and a reduced likelihood of actually following through on one's intended action. Interestingly, experience mattered for the accuracy of participants' predictions for what was to come during goal pursuit – novice if-then planners displayed a tendency to be worse at predicting the problems that would come their way and how they would cope with them, but this difference dissipated for more experienced participants who should find it easier to understand the challenges that will arise in the future.

While these results are encouraging, they are a first step in this line of examination. To fully answer the question of whether plans encouraged participants to consider scenarios and actions that would have otherwise gone unnoticed, it would be helpful to also measure the extent to which participants encountered situations or undertook actions that occurred outside the bounds of their plans or the extent to which they were surprised about their opportunities/actions that occurred during goal pursuit. Participants may well have also made other plans that went beyond the prompts that we gave them in each condition (for example, maybe if-then planners also utilized elements of when-where-how plans, or vice-versa). If this is the case, the scope of plans we observed is incomplete, and participants may have actually been more or less accurate on their full range of plans than these data indicate. It would also be informative to measure habit, as a related but different explanation for the finding that more experienced participants are better at looking ahead to predict future events is that people who are experienced can form plans by considering pre-existing habits that novices do not possess. In future work, we aim to widen our scope of inquiry to include these other possibilities.

## STUDY 2: TIME PREDICTIONS

In this study, we examined prediction in a different light; we sought to examine how plans change the accuracy of forecasts for the duration of future tasks.

In general, people tend to be rather inaccurate at answering the question, “How long will this task take me to complete?” Specifically, they typically exhibit an optimistic bias, predicting that they will finish their undertaking earlier than the actual time of completion. This phenomenon is commonly referred to in the literature as the “planning fallacy” (Buehler et al. 1994, 2010).

A commonly-advanced cognitive explanation for the planning fallacy is that people rely too heavily upon an “inside perspective” when formulating their forecasts for the duration of the task – they lay out a scenario under which they expect goal pursuit to unfold under ideal conditions, and they fail to consider other possibilities that might occur, such as obstacles or problems that would become apparent by taking into account information like past experiences or base rates of success (Kahneman and Lovallo 1993; Buehler, Griffin, and Ross 2002). Indeed, measures designed to shift participants’ narrative away from a seemingly straightforward and linear simulation of the task, such as soliciting predictions for others’ goal pursuit (Buehler et al. 1994), prompting respondents to “unpack” the task into its constituent parts (Kruger and Evans 2004), and generating “worst-case scenarios” (Newby-Clark et al. 2000) tend to lead to less optimistic and more accurate forecasts.

Engaging in planning has also been shown to change the degree to which individuals fall prey to the planning fallacy. Specifically, planning seems to impact the prediction side of the accuracy equation – individuals change their expectations about how long the task will take, but actual behavior remains relatively unaffected. Buehler and Griffin (2003) demonstrated that

asking participants to think about “when, where, and how” (in other words, a step plan) they would carry out their Christmas shopping exacerbated the planning fallacy by making forecasts more optimistic while leaving the actual finish dates untouched. Buehler and Griffin attribute this increase in optimism to a shift toward “future focus” – that plans facilitate an even greater reliance on the “inside perspective,” causing participants to become too intently focused on a seemingly compelling narrative that results from creating the plan. Conversely, other research demonstrates that thinking about obstacles seems to reduce the optimism in prediction. When individuals are asked to “unpack” a task into each and every one of its component actions (e.g. “getting ready for a date” involves picking out a shirt, picking out a pair of pants, putting on the clothes, brushing your teeth, brushing your hair, etc.; it seems plausible to think of a huge “laundry list” of tasks like this as an obstacle, in contrast to an easily digestible narrative as in Buehler & Griffin’s task), participants made less optimistic forecasts, ameliorating the planning fallacy. Again, these changes in accuracy were driven by changes in participants’ forecasts (Kruger and Evans 2004). Finally, perhaps the most direct evidence for the impact of thinking about steps and obstacles on task time prediction comes from Peetz, Buehler and Wilson (2010), who demonstrated that task prediction times are influenced by contextual factors (they examined temporal distance) which guide participants to be more cognizant of plans or the presence of obstacles.<sup>13</sup> Peetz et al. find that when participants are guided to think about plans (either by

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<sup>13</sup> One critical difference between our studies and the work by Peetz, Buehler, and Wilson is that in their studies, obstacle focus was either manipulated through temporal distance or by directing participants explicitly to think about “possible interruptions” or “a step-by-step plan” / “step-by-step components”) Peetz et al. did not examine the impact of plan format, nor the impact of plans that detail means to cope with obstacles (rather, Peetz et al. had participants think about the presence of potential barriers, not how to deal with them). This distinction is potentially important, as plans that focus participants on how to cope with obstacles may contribute to a narrative that the obstacles are easy to overcome, making predictions more optimistic. The existing data by Peetz et al. do not address this issue. The current investigation also allows us to further disentangle the effect of temporal distance from planning, which was the main focus of investigation for Peetz, Buehler and Wilson.



invoking greater temporal distance or in one experiment, via a direct induction), doing so leads to more optimistic predictions, compared to when individuals think about the presence of obstacles. Changes in these predictions were mediated by thought content.

We build upon this work by examining the impact of different *types* of plans. Neither Buehler and Griffin nor Peetz et al. examine how predictions may change depending on the type of plan that individuals set – either plans which increase the likelihood that individuals will consider how to enact steps, or plans that make it more likely people will think about how to overcome obstacles. Because past work has shown that plans seem to affect bias in the planning fallacy through changes in prediction (and not changes in actual action), we focus on how plans are likely to change forecasts and affect forecast error in turn. As in Study 1, two sets of predictions are possible because of the uncertain role that if-then plans will play.

Existing data from both Buehler and Griffin and Peetz et al. suggest that when-where-how plans should lead to optimistic predictions, as they should focus individuals on an idealized narrative where goal pursuit seems straightforward and subject to little interference from barriers. Following this work, these optimistic forecasts should lead to a greater susceptibility to the planning fallacy – participants’ predictions for when they will finish the task will be less accurate.

Conversely, if-then plans should stimulate thoughts about coping with obstacles, but the effect of this shift is unclear. Our primary hypothesis is that this focus on overcoming barriers will prompt if-then planners to be less optimistic in their forecasts (and thus more accurate) as they recognize that the task which they are asked to consider – shopping for the holidays – may be filled with the need to combat obstacles like crowds, funds shortages, out-of-stock items, etc.

This shift in thought could lead if-then planners to be less optimistic or even pessimistic in their forecasts. However, the coping plans created by participants in the if-then condition may also give rise to thoughts like, “OK, I know what to expect and how to deal with it – I have this under control.” Such a pattern may also lead to optimism in prediction, suggesting that setting *any* plan will exacerbate the planning fallacy by shifting the focus of planners toward narratives where goal pursuit seems routine, idealized, and smooth, akin to the “future focus” account made by Buehler and Griffin.

To tease apart these scenarios, we also included two control conditions. Participants in the no-plan control condition were not directed to set any plan at all as a naturalistic baseline, while participants assigned to a free-plan control condition set their own plans without any guidance on format. If setting any plan is sufficient to lead participants toward optimistic predictions, we should see obstacle-focused if-then planners, step-focused when-where-how planners, and participants in the free-plan control condition all look the same – more optimistic (and thus less accurate). However, if plan type matters, we should see differences emerge between these conditions.

In this study we selected a commonly-enacted goal – shopping for the holidays – because it entails the need to consider both facilitative steps (e.g. figuring out what gifts that recipients would want, traveling to the store or going online to buy those gifts, etc.) and obstacles that might stand in the way (e.g. out-of-stock items, crowds, people who are difficult to buy for, etc.). This goal is also reasonably complex, necessitating that participants think of a number of situations and actions in order to complete it. Finally, this goal has been used in past studies of the planning fallacy (Buehler and Griffin 2003) and we adapted our materials from their investigation, allowing for comparison of results.

### *Participants and Method*

Participants were recruited through Amazon Mechanical Turk, an online crowdsourcing platform commonly used for behavioral experiments (Paolacci, Chandler, and Ipeirotis 2010). The study took place at the beginning of December, 2013, at the start of the Christmas shopping season, and was completed in two waves. In Wave 1, participants were asked to form plans to complete their Christmas shopping and to make a prediction about when that shopping would be completed. In Wave 2, participants were recontacted and they reported the actual date that they finished buying their gifts. Our posting specifically recruited participants in the United States who had remaining Christmas shopping to complete for at least three gift recipients. Geolocation identified 11 participants who completed the survey from outside the United States, so these participants were excluded from the dataset, as shopping procedures and traditions are likely to differ in other cultures. Two participants indicated that they had already completed all their shopping for their intended recipients, so they were also excluded from the dataset, as were three participants whose predicted or actual shopping completion dates were before they started the survey, and three participants who generated no plans conforming to the directions. Examination of the critical dependent measures – participants' predictions for when they would finish their shopping, their actual finish times, and prediction error – revealed the presence of outliers such as predictions of finishing Christmas shopping in late January. To reduce the impact of these outliers but retain participants in the dataset, we Winsorized these variables (Tukey 1962; Chen and Dixon 1972) to set values greater than the 99<sup>th</sup> percentile and less than the 1<sup>st</sup> percentile at the next closest value. Data for these transformations may be found in

TABLE 2.1. The following analyses use the Winsorized measures. Finally, to allow for a consistent set of participants over time, we restricted our analysis sample to participants who completed both Wave 1 and Wave 2. After the exclusions discussed above, 311 shoppers completed Wave 1 and 201 participants completed Wave 2.

At the beginning of Wave 1, participants named three people for whom they still had remaining shopping to finish and indicated how much of their shopping they had already completed. They were asked to think of buying presents for those three target recipients as their goal for the study. Participants were then randomly assigned to one of five conditions for the planning intervention.

In the directions for all conditions except the hybrid condition described below, participants were not directed to consider steps or obstacles but rather we intended the planning interventions themselves to naturally shape the nature of the plans that were formed. To avoid guiding participants as to the content of the means they selected for their plans, all examples that we provided featured both a step-focused and an obstacle-focused plan, and the order of these was counterbalanced. In the if-then condition, participants formed four if-then plans using the prompts shown in APPENDIX 2.1. In the when-where-how condition, participants completed four when-where-how plans. In the free-plan control condition, participants simply saw a text box and were asked to “make a plan for how you will act.” In the no-plan control condition, participants did not see any discussion or intervention about planning. Finally, we collected a hybrid condition as an exploratory attempt to create an optimal planning intervention based on the project management literature for managing undertakings like construction and engineering works (Project Management Institute 2008). Our objectives for this condition were to encourage participants to think broadly about both steps and obstacles, and to consider their actions in an

interdependent manner. Note that in this condition, participants were directed to consider steps and obstacles, unlike in the other conditions we have previously described where the directions were neutral to plan content. Participants first generated two broad categories of actions (e.g., “Figuring out what my gift recipients would like,” or “Staying within my budget”) and then elaborated upon those categories by specifying one to two specific actions for each along with who, how, when/how long, and where those actions would be executed. Participants then laid out two obstacles in an if-then format. Finally, they arranged all of the actions in the expected order of execution. Because this type of plan encourages thoughts about both steps and obstacles, we did not have *a priori* predictions for how it would affect participants’ predictions. Thus, we do not discuss it further. Following the planning interventions, participants created a prediction (including the date and time) for when they expected to finish their shopping for the three people on their list, and they described their thoughts for how that prediction was generated. We also collected measures about participants’ intentions to complete their shopping and their expectation that their prediction would be realized, along with demographic items. In Wave 2, participants were reminded of the three people who they specified on their shopping list and then were asked to indicate the date and time when they finished shopping for those individuals. We then administered measures adapted from Sniehotta et al. (2005) about the degree to which participants formed plans. Finally, respondents completed individual difference scales about their likelihood to elaborate upon potential outcomes (Nenkov et al. 2008) and the propensity to plan (Lynch Jr. et al. 2010).

In the analyses that follow, we focus upon three pieces of information. First, since participants were not directed by us to consider steps or obstacles we evaluated whether indeed changes in the plan format led to changes in thought content. Second, we examined whether each

type of plan led to changes in forecasts and in turn, accuracy for when the shopping task would be completed. Finally, we evaluated whether or not any changes in forecasts were driven by plan content.

### *Results*

*Does plan type influence plan content?* First, because participants were not directed by us to think about either steps or obstacles, we sought to determine whether the type of plan that participants formed guided the situations and actions they considered. We predicted that forming if-then plans would increase the likelihood that participants would consider means to cope with obstacles, while forming when-where-how plans would make steps more prominent. Two raters blind to hypothesis independently coded each plan statement to evaluate whether it referred to a facilitative step or to an obstacle and reached consensus on as many non-matching items as possible. Interrater reliability was good (intraclass correlation for proportions = .88). No-plan control participants ( $n = 43$ ) did not form known plans, so they are not included in these analyses. As expected, the type of plan that participants formed influenced the situations and actions they considered. We examined these plans in two ways. First, we calculated the proportion of each participant's plan statements that were focused on obstacle coping and transformed these proportions using an arcsine-root transformation as outlined by Sokal and Rohlf (1995) and then used this as the dependent measure in an ANOVA with planned comparisons. Untransformed means are reported for interpretability. Consistent with past research, forming a when-where-how plan caused participants to devote nearly all of their attention to facilitative actions, and almost none to how to deal with obstacles ( $M_{\text{WWH}} = .05$ ,  $SD = .11$ ). In contrast, forming if-then plans greatly increased participants' likelihood of considering

how to cope with obstacles ( $M_{IT} = .57, SD = .36$ ), a difference that was statistically significant ( $F(1, 113) = 100.87, p = < .001$ ).

Second, direct comparison of the proportion of obstacle statements in the free-plan control condition was not possible, since free-plan participants each only formed one statement. Thus, we also compared the first statement that participants made in the if-then and when-where how conditions – which should reflect the type of action that was most pressingly on participants’ minds – with the unguided plans in the free-plan condition. When participants were given no guidance on how to form a plan, they focused mainly on steps but did devote some attention to strategies to cope with barriers ( $M_{FREE-PLAN} = .26, SD = .45$ ). Setting an if-then plan increased the likelihood of considering obstacles ( $M_{IT} = .67, SD = .48$ ) while setting a when-where-how plan focused the attention exclusively on steps ( $M_{IT} = .00, SD = .00$ ). Z-tests for proportions at the .05 significance level confirmed that each of these proportions differed from each other.

Thus, as in the first study of Chapter 1, the format of plans changed the situations and actions that individuals focus upon when considering how to pursue the goal. When they were left to their own devices to make a plan, these participants thought mostly about how to enact steps to reach the goal but also devoted some thought to how to cope with problems. When-where-how plans intensified the focus on steps, while if-then plans cast a greater light on means to cope with obstacles.<sup>14</sup>

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<sup>14</sup> Interestingly, one may note that participants in the free plan condition were more likely to focus on obstacles in this task versus in the first study of Chapter 1, which contained a similar intervention and was also about completing holiday shopping. This difference may relate to characteristics of the sample. Participants in the current study were mainly non-student community members from Mechanical Turk, while participants in Chapter 1, Study 1 were undergraduate students at a large U.S. university. Our Mechanical Turk sample also contained some students and they formed plans containing fewer obstacles than non-students. When the entire sample who formed plans is considered (not just those participants who also completed Wave 2), a t-test using the arcsine-root transformed proportion of coping plans indicated that this difference was significant ( $t(242) = -2.149, p = .03$ ). In the smaller

*Does plan type influence prediction optimism and accuracy?* Next, we generated participants' predicted and actual shopping completion times and dates to numerical values by converting the time to a fraction of the day and adding it to the date value (e.g. a participant predicting that they would finish shopping on December 18 at 12:00 pm received a score of 18.50, a participant actually finishing on December 20 at 6:00 pm received a score of 20.75). We then calculated prediction error by subtracting the actual date from the forecast (the participant in the example above would have an error score of -2.25; in other words, his forecasted completion date was 2.25 days early compared to reality).

Overall, plan type significantly affected the accuracy of participants' predictions about when they would complete their Christmas shopping. In all conditions, participants generated forecasts that were too optimistic – they predicted that they would finish their shopping earlier than they actually did. However, the type of plan that participants formed changed the degree of their bias. Consistent with prior work (Buehler et al. 1994; Buehler and Griffin 2003), the underlying reason driving the planning fallacy was not because the plans changed participants' actual behavior – in other words, when they actually finished their Christmas shopping – but rather, the plans changed shoppers' initial forecasts about when they would wrap up the task.

First, using an ANOVA with planned contrasts, we compared the two control conditions to evaluate whether the act of setting any plan influences the planning fallacy in and of itself because it shifts one's focus to the future, or whether the type of plan yields changes in their forecast optimism and accuracy. As a reminder, participants set no plans in the no-plan control condition, and set unguided plans with no specified format in the free plan condition. No-plan

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sample of participants who completed both Waves 1 and 2, this difference was in the same direction but failed to reach significance. While not conclusive, these trends provide some insight that participants in this population seem more prone to naturally considering barriers, at least in the context of Christmas shopping.



control participants predicted that they would finish their shopping approximately three days before they actually did so ( $M_{\text{NO-PLAN}} = -3.05$ ,  $SD = 4.50$ ). Free-plan participants were slightly more optimistic ( $M_{\text{FREE-PLAN}} = -3.41$ ,  $SD = 4.34$ ), but this difference between control conditions was not significant ( $F(1, 196) = .11$ ,  $p = .74$ ). Breaking down accuracy into its two components, neither forecasts ( $M_{\text{NO-PLAN}} = 18.76$ ,  $SD_{\text{NO-PLAN}} = 4.31$  v.  $M_{\text{FREE-PLAN}} = 18.09$ ,  $SD_{\text{FREE-PLAN}} = 3.72$ ;  $F(1,196) = .55$ ,  $p = .46$ ) nor actual completion times ( $M_{\text{NO-PLAN}} = 21.82$ ,  $SD_{\text{NO-PLAN}} = 2.58$  v.  $M_{\text{FREE-PLAN}} = 21.53$ ,  $SD_{\text{FREE-PLAN}} = 2.92$ ;  $F(1,196) = .12$ ,  $p = .73$ ) differed across control conditions. Thus, the act of simply setting *any* plan does not appear to influence forecast accuracy. Rather, the *type* of plan shapes participants' judgments and in turn the degree to which they exhibit the planning fallacy.

Second, we examined how plan format influenced participants' accuracy in estimating task duration. Because forecast accuracy in the two control conditions did not differ significantly, in subsequent analyses we analyzed them jointly in comparison to the if-then and when-where-how conditions using planned contrasts. Replicating Buehler and Griffin's (2003) finding, participants who set when-where-how plans displayed a greater optimistic bias than participants in the two control conditions, predicting that they would finish their Christmas shopping nearly five and a half days before actually doing so ( $M_{\text{WWH}} = -5.43$ ,  $SD_{\text{WWH}} = 5.33$ ;  $F(1,196) = 5.11$ ,  $p = .03$ ). Conversely, setting an if-then plan led to a reduction in the planning fallacy – if-then planners predicted that they would complete their shopping about two and a half days prior to reality ( $M_{\text{IT}} = -2.46$ ,  $SD_{\text{IT}} = 3.71$ ). This reduction was significant compared to WWH planners ( $F(1,196) = 6.72$ ,  $p = .01$ ). However, contrary to our expectations, if-then planners' accuracy did not differ from control ( $F(1,196) = .64$ ,  $p = .43$ ). Turning to forecasts, WWH planners were significantly more optimistic than IT planners ( $F(1,196) = 8.21$ ,  $p = .005$ ),

with the two control conditions falling in between ( $F_{\text{WWH-CONTROL}}(1,196) = 2.65, p = .105$ ;  $F_{\text{IT-CONTROL}}(1,196) = 3.11, p = .08$ ). In contrast, actual completion times were invariant across conditions ( $F_{\text{WWH-CONTROL}}(1,196) = 1.15, p = .29$ ;  $F_{\text{IT-CONTROL}}(1,196) = .82, p = .37$ ;  $F_{\text{WWH-IT}}(1,196) = .02, p = .88$ ).

Thus, extending Buehler & Griffin's (2003) "future focus" argument, setting plans does change the nature of bias in the planning fallacy. However, the effect is more nuanced than simply shining a more intense spotlight on the future. Simply setting a plan is not sufficient to change the accuracy of participants' forecasts or their optimism, as shown by the lack of a difference between the no-plan control and the free-plan control condition, where participants created plans in an unguided manner.

However, when the nature of the plan directs the spotlight of participants' attention in certain directions, the optimistic nature of planners' forecasts changes. When-where-how planners, who focused nearly exclusively on steps, had much more optimistic expectations for when their Christmas shopping would end, and as a result they experienced an exacerbated planning fallacy. In contrast, if-then planners, who directed their attention more intently at how to cope with obstacles, were less optimistic. They predicted that they would finish their shopping nearly three days later than when-where-how planners, resulting in a reduction in the planning fallacy.

*The relationship between plan content and forecasts.* Thus, we have seen evidence that plan format changes the situations and actions that participants consider, and that that plan format changes the bias in task completion judgments by influencing the optimistic nature of forecasts. In this final set of analyses, we aimed to demonstrate a mediated relationship between plan content and forecasts. Unfortunately, as the results below will show, we did not observe

evidence of such a relationship. Here we tested a mediation model including between plan type as the independent variable, the proportion of obstacle-coping plans that were generated by participants as the mediator, and participants' predictions for when they would complete their shopping as the dependent variable. Because no-plan control participants did not form plans and free-plan control participants only formed one plan (thus making their proportion not directly comparable to if-then and when-where-how planners), we excluded these participants from this analysis and focused our attention upon the difference between if-then and when-where-how planners. A mediation model using Hayes' PROCESS macro with when-where-how planners as the comparison group (Hayes 2009; Hayes and Preacher 2014) revealed that while if-then plans did increase the proportion of obstacles participants included in their plans<sup>15</sup> ( $\beta = .39$ ,  $t(113) = 10.04$ ,  $p < .001$ ), there was no significant relationship between the proportion of obstacles and participants' forecasts for when they would finish shopping ( $\beta = -1.71$ ,  $t(112) = -1.40$ ,  $p = .16$ ). The indirect effect was not significant ( $\beta = -.6653$ , LLCI:  $-1.9040$ , ULCI:  $.2723$ ) while the direct effect was significant ( $\beta = 2.07$ ,  $t(112) = 2.99$ ,  $p = .003$ ). Thus, while setting an if-then plan did lead to a greater likelihood of planning for how to cope with obstacles and also less optimistic forecasts than setting a when-where-how plan, these are independent effects. The change in forecast optimism appears to be driven by a different component process to what we hypothesized.

### *Discussion*

In this study, we examined how setting different types of plans affects the planning fallacy. In line with our earlier findings, making a when-where-how plan naturally focused

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<sup>15</sup> We also used an arcsine-root transformation for the proportion of plans in this analysis because the proportion serves as a dependent variable in the X to M regression equation.

participants on steps to reach the goal, while setting an if-then plan guided participants to think about how to cope with obstacles. Consistent with past research, plans also changed the optimism, and in turn, the accuracy of participants' forecasts for when they would complete an important task (Buehler and Griffin 2003; Peetz et al. 2010). First, we found that setting *any* plan is not sufficient to influence forecasts – participants who set plans with no guidance as to format made predictions that were no different from no-plan controls. Thus, it appears that the effect of forming plans on forecasts is not simply caused by an increased focus on future events as argued by Buehler and Griffin (2003). In other words, planning does not seem to solely shift participants toward a greater propensity to use an inside approach, focused on a single optimistic narrative for how goal pursuit will unfold. Rather, the *type* of plan that people form influences their expectations about the future.

Building upon the work of Peetz et al. (2010), who found that inducing participants to focus on the presence of obstacles led to less optimistic completion time forecasts, we expected that a similar result might emerge when participants set plans for how to cope with barriers to reaching their goal (however, we remained mindful that having a plan to deal with problems might also lend a sense that now one knows how to deal with problems, also creating a sense of optimism). Indeed, plan type did shift the forecasts that participants made. When-where-how participants expected to reach their goal earlier than if-then planners (which also made their forecasts more accurate) with the control conditions falling in between.

However, contrary to our expectations, these differences in forecast optimism and accuracy were not driven by the extent to which participants' plans focused on obstacles versus steps. This result leaves an open book for the process underlying the effect of planning on predictions for the duration of goal pursuit; in our data, it does not appear that the link between

plan format is driven by shifts in future focus or in the relative focus of steps versus obstacles, but rather by another process. We outline possibilities in the General Discussion.

### STUDY 3: EMOTION PREDICTIONS

As with the other two types of judgments that we have examined here, in many cases individuals generate forecasts for their future feelings that are optimistic in nature. In order to predict their upcoming emotions, people also utilize an inside approach by simulating a narrative of how the situation will unfold, but that narrative is often too narrow, too incomplete, and too focused on the central details of the set of events that the individual thinks will happen (Dunning 2007). However, events rarely unfold in exactly the manner we expect, and the emotional experience they bring about is often tempered by peripheral features that are part of the broader experience of life like other concurrent goals, social support/comparisons, etc., but that are typically not included in the experience of simulating how one will feel in the future (Buehler and McFarland 2001; Dunning 2007).

For example, Buehler and McFarland (2001) argue that people are often inattentive to other possible outcomes (e.g., “What if I end up only exercising for half the time I expected?”) or qualifiers to their future emotional state (e.g., “What if I exercise for the amount of time in my goal but feel really physically ill afterwards?”), leading to predictions of more intense feelings. Indeed, they find that participants who adopted an inside approach of simulating the future generated more positive emotional forecasts for positive events and more negative emotional forecasts for negative events, compared to participants who were encouraged to predict their feelings by thinking about the past. Similarly, Liberman, Sagristano, and Trope (2002) use a Construal Level Theory lens to examine the impact of the completeness of people’s narratives upon their forecasts. They argue that when people are induced to think about the distant future, their representations of those events are simpler, more reflective of prototypical experiences, and less likely to include inconsistent details, compared to when those events are considered in the

near future. As such, distant future events are more likely to be simulated in a narrow manner (e.g. “After I exercise for the amount of time in my goal, I’ll feel fantastic about my accomplishment!”), while those in the near future should include more balanced interpretations reflecting a wider range of possibilities (e.g. “After I exercise for the amount of time in my goal, I’ll feel good about my accomplishment, but I’ll probably also feel discouraged because I still find it challenging to lift as much weight as I want to.”). Indeed, Liberman et al. found that predictions for close events – reflecting a more balanced, inclusive narrative – were less extreme and less prototypical than those for the distant future.

To the extent that plans narrow or broaden the narrative that people use to make their forecasts of future feelings by decreasing or increasing the likelihood that they consider obstacles that hinder goal pursuit, they may also change the nature of those forecasts. Specifically, plans that narrow the forecast to focus more strongly on an idealized set of events – when-where-how plans – should lead to more extreme forecasts for future emotion. Conversely, if-then plans that broaden the focus of one’s narrative to include obstacles that would not have otherwise been considered should help the forecaster to recognize that multiple outcomes are possible and that the results of the goal do not occur in a vacuum, leading to more tempered predictions.<sup>16</sup>

### *Participants and Method*

Respondents were participants in the E! program described in Study 1 of this paper. We used the same inclusion criteria as in that study. However, some participants did not provide responses to the questions below, leaving 484 respondents available for analysis here.

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<sup>16</sup> However, as we acknowledged earlier in this paper, if-then plans focused on how to cope with obstacles may lend individuals a sense that they know how to overcome barriers and that the situation is well in hand. In this case, more extreme predictions similar to when-where-how plans should result.

At the beginning of the E! study, participants were randomly assigned to one of four conditions as described in Study 1 and they formed plans using the prompts described above. Following the planning intervention, participants answered questions about their expectations for their future feelings. Using a 7-point scale (0 = not at all, 3 = moderately, 6 = very much), participants predicted how satisfied, happy, and fulfilled they would feel if they were to achieve their E! exercise goal for the following week, and how much they would feel regretful, determined to improve in the future, and wishing they could change the situation if they did not achieve their goal.

### *Results*

First, we averaged the positive items ( $\alpha = .91$ ) and negative items ( $\alpha = .85$ ) into two index variables. The following analyses control for goal intentions as described in Study 1 to account for heterogeneity in participants' commitment to their goals. Recall that our prediction was that when-where-how planners, who are focused on a narrower, more untempered narrative, would predict more intense future positive and negative emotions. Conversely, we expected if-then participants, whose plans encourage the consideration of obstacles that would otherwise be ignored in participants' scenario construction, to have more muted and less extreme expectations for future emotions.

An ANOVA with planned contrasts revealed that, as predicted, when-where-how planners expected to feel more extreme positive emotions ( $M_{\text{WWH}} = 5.93$ ,  $SE_{\text{WWH}} = .08$ ) upon successfully achieving their exercise time goals, compared to control participants ( $M_{\text{CTRL}} = 5.67$ ,



$SE_{CTRL} = .08$ ).<sup>17</sup> This difference was significant ( $F(1, 479) = 4.66, p = .03$ ). However, contrary to our predictions, if-then participants' predictions for positive emotion ( $M_{IT} = 5.80, SE_{IT} = .09$ ) did not vary from those made by respondents in either the control ( $F(1,479) = 1.13, p = .29$ ) or when-where how plan conditions ( $F(1,479) = 1.07, p = .30$ ). Turning to negative emotions, we observed no differences across conditions, again contrary to our expectations. Neither when-where-how planners ( $M_{WWH} = 4.95, SE_{WWH} = .11$ ) nor if-then planners ( $M_{IT} = 5.07, SE_{IT} = .12$ ) made more extreme predictions than control participants ( $M_{CTRL} = 4.96, SE_{CTRL} = .11; F_{WWH-CTRL}(1,479) = .004, p = .95; F_{IT-CTRL}(1,479) = .46, p = .50$ ). If-then and when-where-how planners' predictions also did not differ from each other ( $F(1,479) = .55, p = .46$ ).

### *Discussion*

In this study, we predicted that plans would change the intensity of participants' predicted emotions by narrowing or broadening the narratives they use to make the forecast. While we observed some preliminary evidence of this phenomenon – when-where-how plans did lead to more extreme predictions of positive emotion as hypothesized – we did not observe the predicted effects for predictions about negative feelings nor for predictions made by if-then planners. In hindsight, some modifications to our stimuli and context may have helped to achieve a more conclusive result. First, a more comprehensive list of emotions would have been ideal to tap the range of feelings people may predict that they will feel. While we combined positive and negative emotions into indices, it is possible that they did not represent the full set of feelings experienced by participants. We also recognize that the states of being “determined to improve

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<sup>17</sup> The means reported above are the estimated marginal means including the influence of the goal intentions covariate. Unadjusted means are as follows:  $M_{WWH-POS} = 5.97, SD_{WWH-POS} = 1.04; M_{IT-POS} = 5.83, SD_{IT-POS} = 1.07; M_{CTRL-POS} = 5.64, SD_{CTRL-POS} = 1.15; M_{WWH-NEG} = 5.00, SD_{WWH-NEG} = 1.46; M_{IT-NEG} = 5.11, SD_{IT-NEG} = 1.25; M_{CTRL-NEG} = 4.92, SD_{CTRL-NEG} = 1.48$ .

the future” and “wishing one could change the situation” are associated with emotion but are not a pure representation of such. Second, participants should have been given the opportunity to rate the entire range of emotions for failing to meet the goal, meeting the goal, and exceeding the goal, as the current setup does not allow for the possibility that individuals may feel ambivalent or that they may feel positive emotions after failure (e.g. “I almost got there!”) or negative emotions after success (e.g. “I could have done better”; “Sure, I exercised for 40 minutes but my friend worked out for an hour,” etc.). Third, a context where we can manipulate the prospect of success or failure would provide a more controlled and better demonstration of the proposed effect.

## GENERAL DISCUSSION

In this paper, we examined how setting different types of plans changes the nature of how people make predictions about future goal pursuit. In three domains, we found that the type of plan people set often matters. Based on prior literature, we expected that predictions for future events, for task duration, and for future emotion would be underlain by a common tendency to adopt an “inside strategy” – in other words, generating forecasts by constructing narratives or scenarios by simulating the events and actions that are expected to happen. While this method is commonly used and easy to implement, people have a well-documented tendency to construct their narratives in an incomplete manner, often focusing on a straightforward, idealized path to the objective that does not reflect alternate outcomes, contingencies, or the complexities of actual goal pursuit. By increasing the likelihood that individuals would consider how to cope with barriers, we expected that if-then plans would broaden people’s narratives to also include considerations of paths outside a simple, easy progression from start to finish. In doing so, we expected that if-then planners’ forecasts would better reflect reality, with less optimism. However, we acknowledged the possibility that the opposite may also be true – should if-then plans turn out to be too restrictive or lend people a sense that dealing with barriers is well in hand (“OK, now I know how to overcome these problems”), we foresaw that if-then plans may actually lead to greater optimism and a poorer reflection of reality.

The direction of our results varied depending on the type of prediction that was at hand. Our results provide a compelling basis for further inquiry, but more work is needed. We will summarize our findings below and then elaborate upon adjustments to theory that may help to clarify future directions.

First, we examined how plans guide people to be more or less accurate to predict the situations that will occur in the future and whether they will carry out their intended action. We found that participants who set when-where-how plans that were focused on enacting steps were more accurate compared to if-then plans centered on coping with obstacles. When-where-how planners were more likely to include scenarios in their plans that actually arose, and they were more likely to have carried out their specified action when given the opportunity. Importantly, this effect was qualified by an interaction with task experience; figuring out the road ahead should be most challenging for those who have seldom travelled it before. Indeed, the cross-plan differences we observed were driven by novices, with cross-plan differences in accuracy dissipating for more experienced individuals. Thus, if-then plans did not appear to broaden participants' predictions in this context – they did not lead to a better sense of what to expect. Rather, their probabilistic nature seems to have led to participants being more likely to expect events that did not happen and actions that were not carried out.

Second, we demonstrated that plans also influence people's forecasts for how long a valued but somewhat arduous task – Christmas shopping – will take to complete. Here, we built on prior work showing that setting plans leads to more optimistic forecasts versus considering the presence of obstacles, which make forecasts less optimistic. We add to this body of findings by revealing that the type of plan matters to how people make predictions. Simply setting any plan is not enough – participants given no guidance on how to set their plans set forecasts that were no different than individuals assigned to a no-plan control. Rather, consistent with previous findings, when-where-how plans make forecasts more optimistic. Participants who formed this type of plan predicted that they would be done with their shopping earlier than both control participants and if-then planners, who were slightly less optimistic than those in the control

condition. In turn, these optimistic forecasts meant when-where-how planners were also less accurate, since actual completion times did not vary across conditions. As described above, we expected these differences in forecasts to be driven by changes in the content of participants' plans – specifically, the likelihood that they considered obstacles – but we did not find evidence that plan content mediates changes in forecasts driving the planning fallacy, suggesting that another process is at work.

Third, we examined predictions for future emotion. Based on findings showing that generating narratives by simulating the future using a narrow, inside approach led to predictions of more intense future feelings, we expected that when-where-how planners would show this effect. Conversely, by incorporating how to cope with potential obstacles, if-then planners should recognize that the path to goal achievement rarely unfolds in an idealized manner and that the potential paths to the goal are equifinal. While we observed preliminary evidence of this hypothesis – when-where-how planners did indeed report that they expected to feel more intense positive emotion – results for if-then planners and for negative emotions were inconclusive.

### *Theoretical refinements*

We predicted that plans would change the scope of the narratives that people form to make forecasts using an inside strategy. By concentrating people on steps to reach the goal, when-where-how plans should intensify the focus on a narrow, idealized path and lead to more optimistic, less accurate forecasts. In contrast, we expected that if-then plans, by focusing individuals more intently on how to cope with obstacles, would broaden the simulations used to generate forecasts, leading to predictions that are less optimistic and a better reflection of reality. Our results in Study 1 do not conform to this pattern: when-where-how planners were better judges of the events and actions that lay ahead. Study 2 was supportive of the theory, but not for

the right reason: plan content did not mediate the link between plan type and forecasts. Study 3 provides supportive but preliminary data for the role of planning in influencing forecasts of future emotion.

Thus, some adjustment to the theory seems beneficial. One possibility is that if-then and when-where-how plans still change the tenor of people's forecasts generated upon the basis of an "inside strategy" narrative, but they do not do so by influencing the breadth of content (i.e., the relative focus on steps versus obstacles). Rather than broadening people's predictive narrative by encouraging them to think about obstacles, the more contingent nature of the if-then plan may lead to the recognition by forecasters that multiple paths are possible, the future is uncertain, and any scenario that is constructed is necessarily incomplete. Conversely, by focusing individuals on a seemingly straightforward path that seems feasible, when-where-how plans may reinforce certainty that one's goal pursuit will be more likely to proceed in the way that is planned. In other words, different types of plans may influence forecasts by changing the answer to the question, "How sure am I that I know what will happen?"

To elaborate, let us return to the nature of the prompts themselves. Consider the fact that if-then plans begin with "if," which is in and of itself a recognition that circumstances are somewhat stochastic, control is lower, and that there often exists the necessity to react to situations that arise from factors beyond one's own volition. One often has to wait for the right conditions to act, and sometimes those conditions are unpredictable. In contrast, by asking participants to lay out steps they will take, when-where-how plans reinforce the idea that the planner is in control of the eventual set of events that will happen in the future.

This varying sense of certainty in the quality or inclusiveness of one's expected narrative for future goal pursuit seems to largely fit the pattern of results we have observed. Consider

Study 1, where we evaluated whether participants' plans reflected the set of events that actually arose. If-then participants who feel less certain about what will happen in the future may have been motivated to include more unconventional or creative events/actions in their plans to enact "just in case" they are off-target about how the future will unfold. If these unconventional events have a lower probability of actually occurring, the if-then planner's overall level of accuracy for predicting what will happen will be reduced.

Similarly, for the completion time estimates in Study 2, the relative sense of certainty created by the structure of the when-where-how plan may have reinforced those participants' confidence that they can accurately predict the events to come, leading to more bullish predictions for when the goal will be completed. Conversely, if-then planners with more uncertainty about their ability to accurately see into the upcoming haze of mall visits, gift lists, and sale tags should be more conservative in their forecasts, which is what we observed. The control condition, which yielded results similar to if-then plans, may reflect the importance of considering people's base levels of uncertainty toward the situation. While people are typically optimistic in their forecasts when left to their own devices to form them, they are still "situated optimists" and their forecasts are bounded by their underlying evaluation of the situation (Armor and Taylor 1998). For most people, Christmas shopping is an inherently unpredictable experience – "Will the store have the item I need," "Will Uncle Paul really like those socks I got him," "How will I stick to my budget," etc. – and it is possible that participants in this context naturally simulated the process of shopping with much of the same focus as if-then planners. In a different context where natural uncertainty is less prevalent, no-plan controls may look more like when-where-how planners.

This perspective also seems to fit with existing literature on prediction and overconfidence. For example, being reminded that a situation can occur in many different ways and that knowing which version of events will occur is difficult to anticipate leads participants to generate wider confidence intervals around their predictions (Griffin, Dunning, and Ross 1990), and calibration improves when they are prompted to also consider information that is contrary to their initial forecast (Koriat, Lichtenstein, and Fischhoff 1980; Hoch 1985; Newby-Clark et al. 2000). We leave evaluation of this hypothesis to future investigation.

A second theoretical direction may be the consideration of how plans are likely to affect participants' regulatory focus orientation. In Chapter 1, we argued that if-then plans are likely to prompt a prevention focus while when-where-how plans should guide individuals toward a promotion focus. This theoretical framing also accommodates the results of Studies 1 and 2. First, consider the results of Study 1, where we evaluated whether participants' plans accurately reflected the events that actually occurred. Prior work has shown that individuals with a promotion focus are primarily concerned with ensuring they take actions that strive toward gains, and seeking to avoid errors of omission – in other words, making sure that one does not fail to actually do what one has intended. Conversely, a prevention focus prompts actions that result in non-losses and guard against errors of commission – in other words, ensuring that one avoids doing something that one did not intend to do (Crowe and Higgins 1997). Recall that in Study 1, when-where-how participants were significantly more likely to formulate plans which they had the opportunity to enact, and they were also more likely to carry out those plans compared to if-then planners. This pattern is consistent with when-where-how participants being more concerned with seeking to avoid acts of omission – perhaps they were more likely to select plans they knew they could carry out. Further, regulatory focus has also been linked to the tendency to



adopt an optimistic or a pessimistic outlook when forecasting, with promotion-focused individuals expressing a preference for optimistic forecasts and a greater tendency to make them, and prevention focus leading people toward a pessimistic outlook (Hazlett, Molden, and Sackett 2011). This orientation fits with the general findings of Study 2, where when-where-how participants generated significantly more optimistic forecasts for finishing their Christmas shopping than did if-then participants. We are currently further examining the role of regulatory focus as a mechanism for the influence of plans on prediction.

### *Conclusion*

People spend a great deal of time, effort, and resources forming predictions about how their future goal pursuit will unfold. For instance, they try to forecast what will happen and how they will act in the future, how long tasks will take to complete, and how they will feel along the way. Forecasts are also often closely linked with plans – our expectations of the future serve as inputs to planning and are shaped by the planned means that we select to pursue goals. Unfortunately, people are often biased in their forecasts. They fail to fully account for the realities of the situation, which often leaves them unduly optimistic. In this paper, we examined the relationship between planning and forecasting and explored the extent to which different types of plans which have been found in the literature change people's predictions about the future; we did so with the aim that better plans should hopefully lead to better forecasts, and vice versa. While our results were mixed, they provide a foundation to continue the objective of helping individuals to be more likely to achieve their goals.

**TABLE 2.1: WINSORIZED VALUES FOR CHRISTMAS SHOPPING PREDICTIONS, ACTUAL FINISH DATES, AND PREDICTION ERROR – STUDY 2**

	Predicted finish date	Actual finish date	Prediction error
Mean	18.73	22.22	-3.55
Minimum / Maximum	9.71 / 52.71	12.58 / 43.79	-29.88 / 30.83
1 <sup>st</sup> percentile	10.51	13.67	-24.10
99 <sup>th</sup> percentile	30.21	43.40	9.06
Winsorized mean	18.65	22.22	-3.63

Note: These values are coded as dates in December. For example, December 18 at approximately 4:50 pm is coded 18.70. The time is represented as the proportion of the 24h period. Thus, .70 days = [16 hours i.e. 4:00 pm + (50min/hour = .833 hours)]/24 hours/day]. 52.71 represents January 21 at approximately 5:00 pm (December 31 + 21.71 days). Minor differences of a few minutes may occur due to rounding.

**TABLE 2.2: MEAN PREDICTED TASK COMPLETION DATES, ACTUAL COMPLETION DATES, AND PREDICTION ERROR – STUDY 2**

	Predicted finish date	Actual finish date	Prediction error
No-plan control	18.76 (4.31)	21.82 (2.58)	-3.05 (4.50)
Free-plan control	18.09 (3.72)	21.53 (2.92)	-3.41 (4.34)
If-then	19.89 (4.04)	22.36 (2.96)	-2.46 (3.71)
When-where-how	17.07 (4.25)	22.50 (4.51)	-5.43 (5.33)

\*NOTE: Slight differences may occur due to rounding.

**APPENDIX 2.1: PLANNING INSTRUMENTS AND MEASURES - STUDY 2**

<b>Plan type</b>	<b>Format of planning instrument</b>
<i>If-then</i>	<p>IF (fill in a specific, concrete situation that you might encounter when pursuing your goal) <input type="text"/></p> <p>THEN (fill in a specific action that will help you to achieve your goal) <input type="text"/></p>
<i>When-where-how</i>	<p>WHAT (fill in a specific action that will help you to achieve your goal) <input type="text"/></p> <p>WHEN (fill in a time or situation when you will perform that action) <input type="text"/></p> <p>WHERE (fill in a place or setting where you will perform that action) <input type="text"/></p> <p>HOW (fill in specific ways that you will complete that action) <input type="text"/></p> <p>HOW LONG (fill in the duration of time that you will perform that action) <input type="text"/></p>
<i>Hybrid</i>	<p><i>Participants specify two categories for facilitative actions, then asked to elaborate on 1-2 specific actions per category:</i></p> <p>WHAT specific action will you take? <input type="text"/></p> <p>WHO IS RESPONSIBLE for this action? (Who will take the action or ensure it is completed? Will you carry out the action alone or with others?) <input type="text"/></p> <p>HOW will this action take place? (How will you carry out this action and does this action need any additional resources?) <input type="text"/></p> <p>WHEN and FOR HOW LONG will this action take place? (When will you carry out this action and how long will it take?) <input type="text"/></p> <p>WHERE will this action take place? (In what location will you carry out this action?) <input type="text"/></p> <p><i>Participants then specify two obstacle coping strategies:</i></p> <p>IF (fill in a specific, concrete obstacle that you might encounter when pursuing your goal) <input type="text"/></p> <p>THEN (fill in a specific action that will help you to achieve your goal) <input type="text"/></p> <p><i>Participants then arrange all actions in order of anticipated completion.</i></p>
<i>Free-plan</i>	<i>Participants given a text field and asked to “make a plan for how you will act.”</i>
<i>No-plan control</i>	<i>Participants not asked to think about planning</i>

In addition to the measures described above and in the main body of the paper, in Wave 1 participants completed measures on how effective they judged their plan would be at helping

them to finish their shopping, a thought listing about how they arrived at their shopping forecast, the likelihood and intentions that they would complete their shopping in time, an attention check, and demographics. In Wave 2, participants completed measures about the judged extent of their planning (adapted from Sniehotta et al. 2005), their certainty about completion times, and scales on elaboration on potential outcomes (Nenkov et al. 2008) and trait propensity to plan (Lynch Jr. et al. 2010).

### **CHAPTER 3: CONCLUSION**

Understanding goal pursuit is an essential part of understanding consumer behavior. A great deal of the actions that we undertake in our role as consumers are driven by the intention to achieve valued consumption, self-control, and experiential goals (Bagozzi and Dholakia 1999). However, people often experience a gap between their intentions to perform (or avoid) goal-consistent behaviors and actual behavioral outcomes. They miss the opportunity to take the stairs instead of the elevator to work toward a fitness goal, they go to parties instead of hitting the books, and they are not mindful that long lines and crowds are likely to put a snag in their holiday shopping excursions.

Forming plans has been frequently proposed in the literature as a way for people to overcome the intention-behavior gap by strengthening the link between situational cues in which action is desirable and a pre-specified behavior that can then be executed without the need to deliberate in the moment. In doing so, plans help people get started along the road to goal pursuit, shield themselves from distractions, and overcome bad habits (Gollwitzer 1999).

Indeed, much research has shown that plans often work well, yielding impressive patterns of effects in a variety of contexts (Gollwitzer and Sheeran 2006), and they have been proposed as an ideal means to help improve people to achieve goals in the consumer behavior domain (Gollwitzer and Sheeran 2009). Their intuitive appeal for consumers, managers, and researchers is clear – on the surface, plans seem like a relatively straightforward, easy-to-administer, and

inexpensive way to promote goal achievement not only within the confines of the lab but also in “real” consumption and purchase domains.

However, recent work (including the work presented in this dissertation) tells somewhat of a more nuanced and complex story about the effectiveness of plans when they are used in the contexts that often matter to marketers. Sometimes plans work well, but sometimes plans do little to help people to achieve goals, and sometimes they can even be counterproductive (e.g. Bayuk et al. 2010; Skår et al. 2011; Dalton and Spiller 2012; Townsend and Liu 2012). Plans that do little to help consumers to act in ways that help them to achieve goals are a suboptimal use of resources, time, and effort, but relatively little work has examined potential shortfalls in plan effectiveness. In order to realize the potential of planning in a consumer context, it is critical that we understand the processes governing how plans influence consumption-type behaviors, with the intent of designing and implementing interventions that are more consistent, reliable, and effective.

In the two essays of this dissertation, I presented two sets of findings aimed at contributing to our understanding of how plans drive processes that help and hinder real goal pursuit. In Chapter 1, I examined how two types of plans that have been used rather interchangeably in the literature – “if-then” plans and “when-where-how” plans – give rise to processes influencing goal pursuit over time. I started with a somewhat puzzling finding – consistent with recent literature showing the drawbacks of planning, these interventions appeared to not be helping people to achieve their goals. A critical question, then, was why. First, I demonstrated that plans are not alike in terms of the content that they generate. Building upon the distinction found in the health psychology literature between plans for coping with obstacles versus plans for facilitative actions, I showed that if-then and when-where-how plans work to

naturally shift participants' focus between these two types of means. If-then plans prompted a greater attention toward coping plans, while when-where-how plans encouraged the development of facilitative steps to reach the goal.

In two field studies, I then revealed the implications of this shift in thought by examining how both types of plans work over time. By inducing a greater emphasis on coping with problems, if-then plans break people away from their natural tendency to think deeply about steps, but at the same time lock them into a less-flexible conception of how they are acting toward the goal. As a result, when if-then planners ask, "How am I doing," they report doing a worse job at acting in ways that help them to achieve the goal, compared to a no-plan control condition. This leads them to feel regret and to change their expectations and actions for the future. Experience also plays a critical role – regret can be motivating for those who have successfully pursued the goal many times before, but can harm goal pursuit for people who are relative novices. The implications of these process findings are important. By helping beginners to plan like those who are more experienced – for example, by guiding them to think about situations and actions that are more likely to occur, or by harnessing the motivating role of regret along with a learning rather than a performance orientation – there exists the prospect to help planners to develop plans that better propel them toward their goals.

In Chapter 2, I examined planning from a different perspective: prediction. In order to plan, people have to forecast the types of situations they will encounter and the feasibility, effectiveness, and desirability of their intended actions. Ideally, better forecasts and more effective plans should go hand-in-hand. Interventions that help people to correctly anticipate future events should lead to better preparation and action execution when those circumstances arise. Conversely, plans that lead individuals to do a poor job of anticipating the road ahead seem



likely to divert attention and resources away from important events and actions, increasing the probability that performance will be reduced. For example, a consumer with a fitness goal who is distracted by figuring out how to cope with exercising in bad weather despite sunny skies would seem to be less prepared and likely to perform optimally than another exerciser focused on laying out strategies for situations that actually do occur. I studied how planning interventions influence forecasts from three perspectives.

In Study 1, I explored whether if-then plans or when-where-how plans are better at helping people to consider situations and actions that better reflect reality. In other words, which type of plan contained more situations and actions that actually happened during goal pursuit? Indeed, it seems likely that a plan will yield the best preparation to pursue the goal when planners correctly predict the set of circumstances that they will encounter and the corresponding actions that are feasible and desirable to execute. Otherwise, one risks being caught off guard by unexpected problems or missing opportunities to move toward the goal. Here, the obstacle-focused nature of the if-then format led participants to create plans that were more narrow – these planners reported fewer opportunities to act and less success at executing their actions as they had expected, compared to when-where-how planners. This difference was particularly evident for novices, underscoring the recurring and complex role of the relationship between planning and experience with the goal.

In Study 2, I examined how plans influence forecasts for how long a task will take to complete. Past work on the planning fallacy – a persistent bias whereby people routinely underestimate task duration – has shown that plans about when, where, and how action will occur lead to more optimistic forecasts (Buehler and Griffin 2003). People often tend to make forecasts using an “inside perspective,” by focusing upon the generation of a narrative that lays

out an expected set of events that is overly simplistic and idealistic, rather than an “outside” set of inputs based on past experiences, base rates, etc. (Kahneman and Lovallo 1993; Dunning 2007). Borrowing from a familiar cliché, planners are more likely to simulate a set of events where “all will go according to plan” and neglect to think about potential problems, which leads to more optimistic forecasts. While feeling optimistic may sometimes be functional and facilitate goal pursuit in the face of challenge, optimism can also hinder goal pursuit by causing people to be ignorant or less worried about threats and undermining the corresponding need to act (Weinstein 1982; Schwarz 1998). This latter “dark side” to optimism may lead individuals to believe that goal pursuit will be swift, postponing action, shifting attention to other responsibilities, and causing a lack of time to complete required tasks or increased costs due to delays. For example, one can easily imagine a consumer trying to pay off a loan for a large purchase like a house or a car and optimistically predicting, “Everything will be fine, I can definitely get this paid off by the end of the summer...I can treat myself to that new TV,” while someone less optimistic might think, “This is going to take me a long time, probably until late autumn. I’d better get started right away.”

However, what if the type of plan that was formed led people to be more likely to consider obstacles? Would that reduce forecasters’ dependence on idealized, “inside perspective” narratives and make their forecasts less optimistic, thus reducing the planning fallacy? The results of Study 2 are a first step in answering that question. First, I showed that setting *any* type of plan is not sufficient to induce changes in the planning fallacy – participants who set a plan with no guidance on format performed no differently than those who set no plan at all. However, the *type* of plan that people generated did affect their forecasts. Replicating past research, when-where-how plans that were focused on steps did increase optimism in participants’ forecasts. In

turn, if-then plans reduced that optimism compared to when-where-how planners, but contrary to expectations, they did not change their optimism significantly compared to control. Similarly, if-then planners were more accurate in their forecasts than when-where-how planners, but neither group differed significantly from control. Unexpectedly, changes in plan content did not mediate the relationship between plan type and forecasts, suggesting that another process is at work; further examination into regulatory focus/fit or how plans change participants' confidence in the accuracy or precision of their forecasts (e.g. perhaps the more contingent nature of if-then plans leads participants to believe their forecasts will be less accurate/precise while when-where-how planning leads to more confidence due to the presence of at least one way forward) may be promising.

In Study 3, I examined the link between planning and prediction for future emotion. As described above, past work has shown that people often forecast their feelings by constructing narratives of upcoming events; the incomplete nature of these narratives can also lead to more extreme predictions of emotion – by focusing on a narrower range of possible outcomes and events, expectations for future feelings are less likely to be qualified by factors that are likely to temper one's evaluation (Buehler and McFarland 2001; Liberman et al. 2002). For example, a runner might consider the emotional “high” he gets from finishing a race but fail to appreciate the possibility of those positive feelings being moderated by physical pain from shin splints or his relative standing on the leaderboard. Because they are more likely to consider obstacles that would otherwise be unconsidered, I expected that if-then planners would generate more muted expectations of their future feelings. Conversely, to the extent that when-where-how plans generated a focus on an idealized narrative for how goal pursuit would unfold, I expected emotion predictions to be more toward the extreme ends of the rating scale. Unfortunately the

results from this study yielded little evidence in support of these predictions. While when-where-how planners did report that they expected to feel greater future positive emotions compared to control, no significant findings emerged for if-then planners. Predictions for negative emotions also did not yield significant results. I am hopeful that with methodological refinements (including a context where success or failure can be manipulated), future research will yield more answers to the question of how plans change the prediction of future feelings.

Overall, then, the influence of plans on prediction is a mixed picture. While these findings offer some evidence that plans influence the ways in which people make forecasts, they are a first step in developing our understanding. To that end, I presented a number of methodological and theoretical refinements that I hope will serve as a foundation for future research in this area.

Together, the findings from Chapters 1 and 2 reveal that as consumers, managers, and researchers, we should be mindful of the types of planning tools that we use, evaluating their effect both in terms of the types of situations and actions that participants include and at the level of psychological processes. Recently, in their comprehensive review of the planning literature, Hagger and Luszczynska (2014) noted that, among other priorities, future research should work to delineate the effects of varied types of planning interventions and to evaluate additional mediating and moderating processes underlying planning. This work provides a contribution to that aim. Further, there emerges a number of practical recommendations. We should be cognizant of the type of action that each type of plan evokes – how to enact steps or cope with obstacles – and consider which is more critical for the goal context at hand. We should also be aware that if-then plans can be inflexible in some conditions, leading people to recognize deficiencies in goal pursuit and select plans that they do not have the opportunity to enact, particularly when they are

used by novices who may find it difficult to recognize future obstacles. As such, interventions like additional guidance on possible scenarios or the use of mental contrasting in combination with implementation intentions (mental contrasting involves thinking about a desired future outcome and contrasting it with barriers that currently exist to hinder progress toward that outcome; e.g. Adriaanse et al. 2010) may help planners to have a better view of impediments that lie ahead. Further, pairing plans with interventions designed to frame goal pursuit as an opportunity to learn over time rather than as a reflection of one's ability may also prove useful to turn regret into a positive force for motivation. We are currently testing such ideas.

Overall, it seems that planning currently occupies an uncertain role in helping consumers to regulate their goal-directed behavior in complex settings with real, consequential goals. While existing work establishes a solid foundation and points to much potential to enact behavior change using these interventions, many questions remain about their consistency and reliability in the field. From a research perspective, this is encouraging, as the area continues to present many avenues to craft planning tools that are more useful for consumers and managers alike. I hope that the findings presented here make a positive contribution toward that end.

## REFERENCES

- Achtziger, Anja, Peter M Gollwitzer, and Paschal Sheeran (2008), "Implementation Intentions and Shielding Goal Striving From Unwanted Thoughts and Feelings," *Personality and Social Psychology Bulletin*, 34(3), 381–93.
- Adriaanse, Marieke A., Gabriele Oettingen, Peter M. Gollwitzer, Erin P. Hennes, Denise T. D. de Ridder, and John B. F. de Wit (2010), "When Planning Is Not Enough: Fighting Unhealthy Snacking Habits by Mental Contrasting with Implementation Intentions (MCII)," *European Journal of Social Psychology*, 40(7), 1277–93.
- Araújo-Soares, Vera, Teresa McIntyre, and Falko F. Sniehotta (2009), "Predicting Changes in Physical Activity among Adolescents: The Role of Self-Efficacy, Intention, Action Planning and Coping Planning," *Health Education Research*, 24(1), 128–39.
- Armor, David A. and Shelley E. Taylor (1998), "Situating Optimism: Specific Outcome Expectancies and Self-Regulation," *Advances in Experimental Social Psychology*, 30, 309–79.
- Bagozzi, Richard P. and Utpal Dholakia (1999), "Goal Setting and Goal Striving in Consumer Behavior," *Journal of Marketing*, 63, 19–32.
- Balcetis, Emily and David A. Dunning (2008), "A Mile in Moccasins: How Situational Experience Diminishes Dispositionism in Social Inference," *Personality and Social Psychology Bulletin*, 34(1), 102–14.
- Bandura, Albert (1977), "Self-Efficacy: Toward a Unifying Theory of Behavioral Change.," *Psychological Review*, 84(2), 191.
- Bayuk, Julia Belyavsky, Chris Janiszewski, and Robyn A. Leboeuf (2010), "Letting Good Opportunities Pass Us By: Examining the Role of Mind-Set during Goal Pursuit," *Journal of Consumer Research*, 37(4), 570–83.
- Brandstätter, Veronika, Angelika Lengfelder, and Peter M. Gollwitzer (2001), "Implementation Intentions and Efficient Action Initiation," *Journal of Personality and Social Psychology*, 81(5), 946–60.
- Brockner, Joel, Srikanth Paruchuri, Lorraine Chen Idson, and E. Tory Higgins (2002), "Regulatory Focus and the Probability Estimates of Conjunctive and Disjunctive Events," *Organizational Behavior and Human Decision Processes*, 87(1), 5–24.

- Buehler, Roger and Dale Griffin (2003), "Planning, Personality, and Prediction: The Role of Future Focus in Optimistic Time Predictions," *Organizational Behavior and Human Decision Processes*, 92(1), 80–90.
- Buehler, Roger, Dale Griffin, and Johanna Peetz (2010), "Chapter One-The Planning Fallacy: Cognitive, Motivational, and Social Origins," *Advances in Experimental Social Psychology*, 43, 1–62.
- Buehler, Roger, Dale Griffin, and Michael Ross (1994), "Exploring the 'Planning Fallacy': Why People Underestimate Their Task Completion Times," *Journal of Personality and Social Psychology*, 67, 366–366.
- (2002), "Inside the Planning Fallacy: The Causes and Consequences of Optimistic Time Predictions," in *Heuristics and Biases: The Psychology of Intuitive Judgment*, ed. T. Gilovich, D. Griffin, and D. Kahneman, New York, NY: Cambridge University Press, 250–70.
- Buehler, Roger and Cathy McFarland (2001), "Intensity Bias in Affective Forecasting: The Role of Temporal Focus," *Personality and Social Psychology Bulletin*, 27(11), 1480–93.
- Campbell, Margaret C. and Caleb Warren (2015), "The Progress Bias in Goal Pursuit: When One Step Forward Seems Larger than One Step Back," *Journal of Consumer Research*, 41(5), 1316–31.
- Carver, Charles S. and Michael F. Scheier (1982), "Control Theory: A Useful Conceptual Framework for Personality–Social, Clinical, and Health Psychology," *Psychological Bulletin*, 92(1), 111–35.
- (1990), "Origins and Functions of Positive and Negative Affect: A Control-Process View," *Psychological Review*, 97(1), 19.
- Chapman, Janine, Christopher J. Armitage, and Paul Norman (2009), "Comparing Implementation Intention Interventions in Relation to Young Adults' Intake of Fruit and Vegetables," *Psychology and Health*, 24(3), 317–32.
- Chen, Edwin H. and W. J. Dixon (1972), "Estimates of Parameters of a Censored Regression Sample," *Journal of the American Statistical Association*, 67(339), 664–71.
- Connolly, Terry and Marcel Zeelenberg (2002), "Regret in Decision Making," *Current Directions in Psychological Science*, 11(6), 212–16.
- Crowe, Ellen and E. Tory Higgins (1997), "Regulatory Focus and Strategic Inclinations: Promotion and Prevention in Decision-Making," *Organizational Behavior and Human Decision Processes*, 69(2), 117–32.
- Dalton, Amy N. and Stephen A. Spiller (2012), "Too Much of a Good Thing: The Benefits of Implementation Intentions Depend on the Number of Goals," *Journal of Consumer Research*, 39(3), 600–614.

- Dunning, David (2007), "Prediction: The Inside View," in *Social Psychology: Handbook of Basic Principles*, Guilford Press, 69–90, <http://psycnet.apa.org/psycinfo/2007-11239-004>.
- Elliott, Elaine S. and Carol S. Dweck (1988), "Goals: An Approach to Motivation and Achievement.," *Journal of personality and social psychology*, 54(1), 5.
- Finkelstein, Eric A., Justin G. Trogon, Joel W. Cohen, and William Dietz (2009), "Annual Medical Spending Attributable to Obesity: Payer-and Service-Specific Estimates," *Health Affairs*, 28(5), w822–31.
- Freitas, Antonio L, Nira Liberman, and E.Tory Higgins (2002), "Regulatory Fit and Resisting Temptation during Goal Pursuit," *Journal of Experimental Social Psychology*, 38(3), 291–98.
- Friedman, Ronald S. (1999), "The Phenomenological Correlates and Consequences of Distinct Self-Regulatory Systems," New York, NY: Columbia University.
- Gilbert, Daniel T., Elizabeth C. Pinel, Timothy D. Wilson, Stephen J. Blumberg, and Thalia P. Wheatley (1998), "Immune Neglect: A Source of Durability Bias in Affective Forecasting," *Journal of Personality and Social Psychology*, 75(3), 617.
- Gilovich, Thomas and Victoria Husted Medvec (1994), "The Temporal Pattern to the Experience of Regret," *Journal of Personality and Social Psychology*, 67(3), 357–65.
- Gilovich, Thomas, Victoria Husted Medvec, and Serena Chen (1995), "Commission, Omission, and Dissonance Reduction: Coping with Regret in the 'Monty Hall' Problem," *Personality and Social Psychology Bulletin*, 21(2), 182–90.
- Gollwitzer, Peter M. (1999), "Implementation Intentions: Strong Effects of Simple Plans," *American Psychologist*, 54(7), 493–503.
- Gollwitzer, Peter M. and Ute Bayer (1999), "Deliberative versus Implemental Mindsets in the Control of Action," in *Dual-Process Theories in Social Psychology*, ed. Shelly Chaiken and Yaacov Trope, New York, NY: Guilford Press, 403–22.
- Gollwitzer, Peter M. and Veronika Brandstätter (1997), "Implementation Intentions and Effective Goal Pursuit," *Journal of Personality and Social Psychology*, 73, 186–99.
- Gollwitzer, Peter M. and Paschal Sheeran (2006), "Implementation Intentions and Goal Achievement: A Meta-Analysis of Effects and Processes," in *Advances in Experimental Social Psychology*, ed. Mark P. Zanna, Academic Press, 69–119.
- (2009), "Self-Regulation of Consumer Decision Making and Behavior: The Role of Implementation Intentions," *Journal of Consumer Psychology*, 19(4), 593–607.
- Griffin, Dale W., David Dunning, and Lee Ross (1990), "The Role of Construal Processes in Overconfident Predictions about the Self and Others," *Journal of Personality and Social Psychology*, 59(6), 1128.



- Hagger, Martin S. and Aleksandra Luszczynska (2014), "Implementation Intention and Action Planning Interventions in Health Contexts: State of the Research and Proposals for the Way Forward: Planning Interventions: The Way Forward," *Applied Psychology: Health and Well-Being*, 6(1), 1–47.
- Hayes, Andrew F. (2015), "An Index and Test of Linear Moderated Mediation," *Multivariate Behavioral Research*, 50(1), 1–22.
- (2009), "Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium," *Communication Monographs*, 76(4), 408–20.
- (2013), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*, New York, NY: Guilford Press.
- Hayes, Andrew F. and Kristopher J. Preacher (2014), "Statistical Mediation Analysis with a Multicategorical Independent Variable," *British Journal of Mathematical and Statistical Psychology*, 67(3), 451–70.
- Hayes-Roth, Barbara and Frederick Hayes-Roth (1979), "A Cognitive Model of Planning," *Cognitive Science*, 3(4), 275–310.
- Hazlett, Abigail, Daniel C. Molden, and Aaron M. Sackett (2011), "Hoping for the Best or Preparing for the Worst? Regulatory Focus and Preferences for Optimism and Pessimism in Predicting Personal Outcomes," *Social Cognition*, 29(1), 74–96.
- Higgins, E. Tory (1997), "Beyond Pleasure and Pain," *American Psychologist*, 52, 1280–1300.
- Hoch, Stephen J. (1985), "Counterfactual Reasoning and Accuracy in Predicting Personal Events," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11(4), 719.
- Hunt, R. Reed and Gilles O. Einstein (1981), "Relational and Item-Specific Information in Memory," *Journal of Verbal Learning and Verbal Behavior*, 20, 497–514.
- IBISWorld (2014), "US Industry Reports (NAICS)," <http://clients1.ibisworld.com/>.
- Inman, J. Jeffrey (2007), "Regret Regulation: Disentangling Self-Reproach from Learning," *Journal of Consumer Psychology*, 17(1), 19–24.
- Kahneman, Daniel and Dan Lovallo (1993), "Timid Choices and Bold Forecasts: A Cognitive Perspective on Risk Taking," *Management Science*, 39(1), 17–31.
- Koehler, Derek J. and Connie S. K. Poon (2006), "Self-Predictions Overweight Strength of Current Intentions," *Journal of Experimental Social Psychology*, 42(4), 517–24.
- Koehler, Derek J., Rebecca J. White, and Leslie K. John (2011), "Good Intentions, Optimistic Self-Predictions, and Missed Opportunities," *Social Psychological and Personality Science*, 2(1), 90–96.

- Koriat, Asher, Sarah Lichtenstein, and Baruch Fischhoff (1980), "Reasons for Confidence," *Journal of Experimental Psychology: Human Learning and Memory*, 6(2), 107.
- Kruger, Justin and Matt Evans (2004), "If You Don't Want to Be Late, Enumerate: Unpacking Reduces the Planning Fallacy," *Journal of Experimental Social Psychology*, 40(5), 586–98.
- Liberman, Nira, Michael D. Sagristano, and Yaacov Trope (2002), "The Effect of Temporal Distance on Level of Mental Construal," *Journal of Experimental Social Psychology*, 38(6), 523–34.
- Lockwood, Penelope, Christian H. Jordan, and Ziva Kunda (2002), "Motivation by Positive or Negative Role Models: Regulatory Focus Determines Who Will Best Inspire Us.," *Journal of Personality and Social Psychology*, 83(4), 854–64.
- Loewenstein, George and David Schkade (1999), "Wouldn't It Be Nice? Predicting Future Feelings," *Well-being: The foundations of hedonic psychology*, 85–105.
- Loyola University Health System (2013), "Top Four Reasons Why Diets Fail," *ScienceDaily*, <http://www.sciencedaily.com/releases/2013/01/130103192352.htm>.
- Lynch Jr., John G., Richard G. Netemeyer, Stephen A. Spiller, and Alessandra Zammit (2010), "A Generalizable Scale of Propensity to Plan: The Long and the Short of Planning for Time and for Money," *Journal of Consumer Research*, 37(1), 108–28.
- Masicampo, E. J. and Roy F. Baumeister (2012), "Committed but Closed-Minded: When Making a Specific Plan for a Goal Hinders Success," *Social Cognition*, 30(1), 37–55.
- Masicampo, E.J., Kathleen D. Vohs, Andrew J. Vonasch, and Roy F. Baumeister (2015), "Mental Simulations Underlie the Beneficial Effects of Specific Plans," *Working paper*.
- Mathieu, John E. and Scott R. Taylor (2006), "Clarifying Conditions and Decision Points for Mediation Type Inferences in Organizational Behavior," *Journal of Organizational Behavior*, 27(8), 1031–56.
- Milkman, K. L., J. Beshears, J. J. Choi, D. Laibson, and B. C. Madrian (2011), "Using Implementation Intentions Prompts to Enhance Influenza Vaccination Rates," *Proceedings of the National Academy of Sciences*, 108(26), 10415–20.
- Nenkov, Gergana Y., J. Jeffrey Inman, and John Hulland (2008), "Considering the Future: The Conceptualization and Measurement of Elaboration on Potential Outcomes," *Journal of Consumer Research*, 35(1), 126–41.
- Newby-Clark, Ian R., Michael Ross, Roger Buehler, Derek J. Koehler, and Dale Griffin (2000), "People Focus on Optimistic Scenarios and Disregard Pessimistic Scenarios While Predicting Task Completion Times," *Journal of Experimental Psychology: Applied*, 6(3), 171–82.

- Oettingen, Gabriele (2012), "Future Thought and Behaviour Change," *European Review of Social Psychology*, 23(1), 1–63.
- Oettingen, Gabriele, Gaby Hönig, and Peter M. Gollwitzer (2000), "Effective Self-Regulation of Goal Attainment," *International Journal of Educational Research*, 33(7–8), 705–32.
- Oettingen, Gabriele, Heather Barry Kappes, Katie B. Guttenberg, and Peter M. Gollwitzer (2015), "Self-Regulation of Time Management: Mental Contrasting with Implementation Intentions," *European Journal of Social Psychology*, 45(2), 218–29.
- Oettingen, Gabriele, Marion Wittchen, and Peter M. Gollwitzer (2013), "Regulating Goal Pursuit Through Mental Contrasting with Implementation Intentions," in *New Developments in Goal Setting and Task Performance*, ed. Edwin A. Locke and Gary P. Latham, New York, NY: Routledge, 523–48, <http://kops.uni-konstanz.de/handle/123456789/26290>.
- Orbell, Sheina, Sarah Hodgkins, and Paschal Sheeran (1997), "Implementation Intentions and the Theory of Planned Behavior," *Personality and Social Psychology Bulletin*, 23(9), 945–54.
- Ordóñez, Lisa D., Maurice E. Schweitzer, Adam D. Galinsky, and Max H. Bazerman (2009), "Goals Gone Wild: The Systematic Side Effects of Overprescribing Goal Setting," *The Academy of Management Perspectives*, 23(1), 6–16.
- Paolacci, Gabriele, Jesse Chandler, and Panagiotis G. Ipeirotis (2010), "Running Experiments on Amazon Mechanical Turk," *Judgment and Decision Making*, 5(5), 411–19.
- Parks-Stamm, Elizabeth J., Peter M. Gollwitzer, and Gabriele Oettingen (2007), "Action Control by Implementation Intentions: Effective Cue Detection and Efficient Response Initiation," *Social Cognition*, 25(2), 248–66.
- Peetz, Johanna, Roger Buehler, and Anne Wilson (2010), "Planning for the near and Distant Future: How Does Temporal Distance Affect Task Completion Predictions?," *Journal of Experimental Social Psychology*, 46(5), 709–20.
- Pham, L. B. and S. E. Taylor (1999), "From Thought to Action: Effects of Process-Versus Outcome-Based Mental Simulations on Performance," *Personality and Social Psychology Bulletin*, 25(2), 250–60.
- Pieters, Rik and Marcel Zeelenberg (2005), "On Bad Decisions and Deciding Badly: When Intention–behavior Inconsistency Is Regrettable," *Organizational Behavior and Human Decision Processes*, 97(1), 18–30.
- Project Management Institute (2008), *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*, Newtown Square, PA: Project Management Institute.
- Roese, Neal J. and Amy Summerville (2005), "What We Regret Most... and Why," *Personality and Social Psychology Bulletin*, 31(9), 1273–85.

- Ross, Michael and Ian R. Newby-Clark (1998), "Construing the Past and Future," *Social Cognition*, 16(1), 133–50.
- Rucker, Derek D., Kristopher J. Preacher, Zakary L. Tormala, and Richard E. Petty (2011), "Mediation Analysis in Social Psychology: Current Practices and New Recommendations: Mediation Analysis in Social Psychology," *Social and Personality Psychology Compass*, 5(6), 359–71.
- Savitsky, Kenneth, Victoria Husted Medvec, and Thomas Gilovich (1997), "Remembering and Regretting: The Zeigarnik Effect and the Cognitive Availability of Regrettable Actions and Inactions," *Personality and Social Psychology Bulletin*, 23(3), 248–57.
- Schwarzer, Ralf (1998), "Optimism, Goals, and Threats: How to Conceptualize Self-Regulatory Processes in the Adoption and Maintenance of Health Behaviors," *Psychology & Health*, 13(4), 759–66.
- Skår, Silje, Falko F. Sniehotta, Gerard J. Molloy, Andrew Prestwich, and Vera Araújo-Soares (2011), "Do Brief Online Planning Interventions Increase Physical Activity amongst University Students? A Randomised Controlled Trial," *Psychology & Health*, 26(4), 399–417.
- Sniehotta, Falko F., Urte Scholz, and Ralf Schwarzer (2006), "Action Plans and Coping Plans for Physical Exercise: A Longitudinal Intervention Study in Cardiac Rehabilitation," *British Journal of Health Psychology*, 11(1), 23–37.
- Sniehotta, Falko F., Ralf Schwarzer, Urte Scholz, and Benjamin Schüz (2005), "Action Planning and Coping Planning for Long-Term Lifestyle Change: Theory and Assessment," *European Journal of Social Psychology*, 35(4), 565–76.
- Sokal, Robert R. and F. James Rohlf (1995), *Biometry*, Macmillan.
- Soman, Dilip and Amar Cheema (2004), "When Goals Are Counterproductive: The Effects of Violation of a Behavioral Goal on Subsequent Performance," *Journal of Consumer Research*, 31(1), 52–62.
- Tanner, Robin J. and Kurt A. Carlson (2009), "Unrealistically Optimistic Consumers: A Selective Hypothesis Testing Account for Optimism in Predictions of Future Behavior," *Journal of Consumer Research*, 35(5), 810–22.
- Taylor, Shelley E. and Peter M. Gollwitzer (1995), "Effects of Mindset on Positive Illusions," *Journal of Personality and Social Psychology*, 69, 213–213.
- Taylor, Shelley E., Lien B. Pham, Inna D. Rivkin, and David A. Armor (1998), "Harnessing the Imagination," *American Psychologist*, 53(4), 429–39.
- Townsend, Claudia and Wendy Liu (2012), "Is Planning Good for You? The Differential Impact of Planning on Self-Regulation," *Journal of Consumer Research*, 39(4), 688–703.

- Tukey, John W. (1962), "The Future of Data Analysis," *The Annals of Mathematical Statistics*, 33(1), 1–67.
- UCLA Statistical Consulting Group "How Does One Do Regression When the Dependent Variable Is a Proportion?," <http://www.ats.ucla.edu/stat/stata/faq/proportion.htm>.
- Ülkümen, Gülden and Amar Cheema (2011), "Framing Goals to Influence Personal Savings: The Role of Specificity and Construal Level," *Journal of Marketing Research*, 48, 958–69.
- Weinstein, Neil D. (1980), "Unrealistic Optimism About Future Life Events," *Journal of Personality and Social Psychology*, 39(5), 806.
- (1982), "Unrealistic Optimism about Susceptibility to Health Problems," *Journal of Behavioral Medicine*, 5(4), 441–60.
- Wells Fargo & Company (2012), *2012 Wells Fargo Retirement Study*, <https://www.wellsfargo.com/downloads/pdf/com/retirement-employee-benefits/insights/2012-retirement-study.pdf>.
- Wilson, Timothy D. and Daniel T. Gilbert (2003), "Affective Forecasting," *Advances in Experimental Social Psychology*, 35, 345–411.
- Zeelenberg, Marcel (1999), "The Use of Crying over Spilled Milk: A Note on the Rationality and Functionality of Regret," *Philosophical Psychology*, 12(3), 325–40.
- Zeelenberg, Marcel and Seger M. Breugelmans (2008), "The Role of Interpersonal Harm in Distinguishing Regret from Guilt," *Emotion*, 8(5), 589.
- Zeelenberg, Marcel, Wilco W van Dijk, Joop van der Pligt, Antony S. R. Manstead, Pepijn van Empelen, and Dimitri Reinderman (1998), "Emotional Reactions to the Outcomes of Decisions: The Role of Counterfactual Thought in the Experience of Regret and Disappointment," *Organizational Behavior and Human Decision Processes*, 75(2), 117–41.
- Zeelenberg, Marcel and Rick Pieters (2007), "A Theory of Regret Regulation 1.0," *Journal of Consumer Psychology*, 17(1), 3–18.
- Zhao, Xinchu, John G. Lynch Jr., and Qimei Chen (2010), "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis," *Journal of Consumer Research*, 37(2), 197–206.
- Zhou, Xiaolei, James Nonnemaker, Beth Sherrill, Alicia W. Gilsenan, Florence Coste, and Robert West (2009), "Attempts to Quit Smoking and Relapse: Factors Associated with Success or Failure from the ATTEMPT Cohort Study," *Addictive Behaviors*, 34(4), 365–73.

Zhu, Rui Juliet and Joan Meyers-Levy (2007), “Exploring the Cognitive Mechanism That Underlies Regulatory Focus Effects,” *Journal of Consumer Research*, 34(1), 89–96.