Looking Back or Looking Ahead:

Metamotivational Beliefs About Progress Framing in Goal Pursuit

by

Jessica Rachael Ross

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Doctor of Philosophy

in

Psychology

Waterloo, Ontario, Canada, 2025

Examining Committee Membership

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner	Justin Cavallo Associate Professor, Department of Psychology, Wilfrid Laurier University
Supervisor	Abigail A. Scholer Professor, Department of Psychology
Internal Member	Richard Eibach Associate Professor, Department of Psychology
Internal-external Member	Adam Preslee Associate Professor, School of Accounting and Finance
Other Member	Neil Hester Assistant Professor, Department of Psychology

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

We are often told that if we keep our eyes on the prize, we will achieve our goals. However, research on the dynamics of self-regulation has established that whether it helps to focus on the starting line or the finish line depends on how committed people are to their goals: if commitment is strong, focusing on remaining progress ("to-go" information) is more motivating, whereas if commitment is weak, focusing on accumulated progress ("to-date" information) is more motivating. Yet research has not systematically examined whether people recognize and leverage these progress framing strategies based on their commitment strength. Across seven studies (N = 2,792), I applied a metamotivational approach to examine the nature and normative accuracy of people's beliefs about progress framing and whether these beliefs manifest in or are related to behavioural and self-regulatory outcomes. Studies 1 and 2 found that people's beliefs about progress framing aligned with normative effects observed in the literature on average, though with substantial variability. Studies 3-5 explored whether beliefs manifest in consequential choices. Study 3 found that people made differential progress framing choices as a function of their own commitment levels for personal goals. However, Studies 4 and 5 failed to replicate this pattern when commitment was experimentally manipulated in lab contexts or when making recommendations for others. Studies 6 and 7 investigated links between beliefs and outcomes, finding no relationship with goal progress (Studies 6 and 7) or life satisfaction (Study 6), though more normatively accurate beliefs were associated with experiencing less distress and difficulty during goal pursuit (Study 7). These findings demonstrate that while people possess a nuanced understanding of progress framing strategies, translating this knowledge into improved self-regulatory outcomes remains complex. By examining the nature and implications of people's

progress framing beliefs, this research offers novel contributions to the field of motivation science with valuable insights for goal pursuit and motivation regulation.

Acknowledgements

Given that my dissertation is complete, I no longer have any progress "to-go" to focus on. All that's left is to reflect on my progress "to-date", and with that comes thoughts about all those who helped me get to this point.

First, I want to thank my supervisor, Abby Scholer. It is hard to put into words just how grateful I am for the support, patience, and guidance you have given me over the past seven years. It has been a privilege to be mentored by someone whose excellence extends beyond her scholarship to the kindness and strength of her character. I truly could not have asked for a better mentor, and I would not have been able to cross this finish line without you.

Thank you to the rest of my committee members—Justin Cavallo, Adam Preslee, Richard Eibach, and Neil Hester—for such thoughtful questions, comments, and feedback on my dissertation. I am also grateful to the rest of the social area faculty for your teaching and support over the years. Special thanks go to Kentaro Fujita, Tina Nguyen, and Monica Grove for their support and insights on this and other metamotivation work we've done together. I also want to thank my undergraduate supervisor, Peter MacIntyre, who set into motion my love of research and provided me with the initial opportunities that ultimately led to this achievement.

To my fellow graduate students, both past and present, thank you for being one of the best parts of this whole experience. I am thankful to my SRM lab mates for providing an environment that was extremely fun while also incredibly supportive and intellectually enriching. A special thank you goes to Erik Jansen, who has endured more than his fair share of my "quick questions" (and existential crises) over the years. And most of all, I want to thank Candice Hubley. I still remember our first visit to UW, learning that Abby had another prospective student from Nova Scotia. Little did I know then that I was meeting someone who would become

a lifelong friend. From brainstorming study designs in our office to dancing at the Eras Tour, thank you for being there for me and for making it feel like there was always a piece of home in Waterloo.

This accomplishment would not have been possible without the love and support from my friends and family back home. First, to my mother, Denitra Kyle, thank you for everything that you have done for me and for the countless sacrifices you made to help get me here. Thank you to my friends in Cape Breton, especially Nicole Sampson and Sheryl Fogarty, who make it feel like I never left whenever I visit. To my Fortnite squad—Brett Yhard, Kyle Dalton, and, of course, Alicia Francis—thank you for the endless laughs and good times. Alicia, it is impossible to describe just how much our friendship has meant to me throughout this journey, so I will just leave it at "you know what I mean."

And finally, to my partner, Joshua Banko—one might think there would be a limit to the amount of love, support, and patience someone could provide to a perpetually exhausted, emotional, and stressed-out grad student, but you've proven that isn't the case. Thank you for always being in my corner.

Table of Contents

List of Figures

List of Tables

Introduction

Picture it: you are coming up on the halfway point of a marathon. The initial excitement that carried you through the early miles has faded, and the finish line feels impossibly far away. Your legs are aching, your breath is laboured, and you feel your motivation faltering as you question why you ever signed up for this in the first place. You have invested months of training, endured early mornings, and sacrificed social events for this goal. Other runners pass you by as your pace slows, and the temptation to walk—or even quit—grows stronger with each step. To achieve your goal of finishing, you must somehow find a way to reignite your motivation.

This scenario is not unique to marathon runners—it reflects a fundamental truth about goal pursuit. That is, while motivation is often greater near the beginning of goal pursuit (e.g., Beshears et al., 2021; Dai et al., 2015) or near the end of goal pursuit (e.g., Becker & van der Pligt, 2016; Cryder et al., 2013; Förster et al., 1998), it tends to decrease at the midpoint (Bonezzi et al., 2011), creating a U-shaped gradient of motivation where the middle phase is particularly challenging. This sag in motivation, combined with the fact that people have multiple goals that are competing for their limited resources (Boudreaux & Ozer, 2013), highlights a fundamental self-regulatory challenge: in order to be successful in goal pursuit, individuals need to find a way to boost motivation for a focal goal in the face of these obstacles.

Prior research suggests that one strategy for upregulating motivation for a focal goal when it is low involves thinking about existing goal progress in distinct ways. In particular, people can either consider their current progress toward a goal in terms of accumulated (to-date) or remaining (to-go) progress (Fishbach et al., 2009; Koo & Fishbach, 2008). Returning to our marathon example, as you approach the midpoint of the marathon and your motivation dwindles, you have the opportunity to either look back toward the starting line and focus on how far you

have come, or “keep your eyes on the prize” and focus on the finish line. This decision is more than just mental gymnastics—it represents a strategic choice that has significant implications for your motivation.

Although conventional wisdom often suggests that people should always keep their eyes on the prize (i.e., progress to-go), research suggests that whether it is more motivating to focus on the starting versus the finish line depends on the strength of commitment that people have to their goals (see Fishbach et al., 2009, for a review). However, existing research has not systematically examined whether people recognize and leverage this strategy of conceptualizing progress in to-date versus to-go terms as a function of commitment strength. People can adopt these progress framings on their own, and indeed are increasingly asked to make explicit choices about progress framings in planning and health apps such as *Notion* and *Zero*. Thus, these framing decisions exist not only as internal mental frameworks for conceptualizing progress, but also as concrete choices about how to track, display, and communicate progress to oneself and others in the real world.

A new but growing area of research on metamotivation—how individuals flexibly monitor and control their motivational states—supports the possibility that people regulate their motivation as a function of their beliefs (Fujita et al., 2024; Miele et al., 2020, 2024; Scholer et al., 2018; Scholer & Miele, 2016). Research in this area has demonstrated that people often hold normatively accurate beliefs about how to effectively manage motivational states across a number of motivational domains, and that the normative accuracy of people’s metamotivational beliefs guides behaviour and performance (Hubley et al., 2024; MacGregor et al., 2017; Nguyen et al., 2019; Scholer & Miele, 2016; Ross et al., 2023).

In my dissertation, I build on this approach to explore people's beliefs about to-date and to-go progress framing. I investigate whether people strategically understand when and how to utilize these progress framings in response to differing levels of goal commitment in order to influence motivation, as well as whether this knowledge predicts self-regulatory outcomes—aligning with growing calls for the exploration of implementing basic motivation science to help people with goal pursuit (Fishbach, 2021). I first provide an overview of the literature on the dynamics of self-regulation, including commitment and progress representations of goal pursuit and the role they play in to-date and to-go progress framing. Then, I introduce metamotivation research, highlighting why this framework is ideal for examining people's beliefs about progress framing. These overviews set the stage for integrating insights from the self-regulation literature with a metamotivational perspective to explore what people believe about how progress framing affects motivation and whether these beliefs influence goal pursuit.

Dynamics of Self-Regulation: Commitment versus Progress Representations of Goals

Pursuing goals effectively is challenging, in part because motivation often waxes and wanes over the course of goal pursuit (Boudreaux & Ozer, 2013; Touré-Tillery & Fishbach, 2011), and people have multiple goals competing for their limited resources (Emmons & King, 1988; Riediger & Freund, 2004). Thus, a fundamental self-regulatory challenge is how to upregulate motivation for a focal goal in the face of these obstacles. Across multiple theories and models of self-regulation, researchers have identified two key constructs as playing a central role in guiding goal regulation: goal commitment (i.e., one's determination to reach a goal; Locke & Latham, 1990) and goal progress (i.e., one's advancement made toward goal completion relative to a standard or reference point; Carver & Scheier, 1998). Broadly, people are more likely to pursue goals to which they are committed (Burkley et al., 2013; Locke et al., 1988; Oettingen et

al., 2009) and to invest in goals when progress falls short of a certain standard (Carver & Scheier, 1998; Higgins, 1997; Johnson et al., 2006). Importantly, however, research suggests that motivation and goal pursuit effectiveness is not just a direct function of one's current level of commitment or progress. Rather, people can view goal pursuit through a commitment lens (Am I really committed?) or a progress lens (Am I making progress?), and these representations of goals affect what type of input is likely to spur further goal engagement (Fishbach & Dhar, 2005; Fishbach et al., 2006, 2008, 2010; Koo & Fishbach, 2008; Koo et al., 2021).

The literature on the dynamics of self-regulation suggests that these distinct representations lead to different interpretations of goal-related actions and information, which can guide goal pursuit in distinct ways (Fishbach, 2022; Fishbach et al., 2006, 2014; Fishbach & Dhar, 2005; Fishbach & Zhang, 2009; Koo & Fishbach, 2008). For instance, imagine that Taylor has a goal to lose 20 pounds. At any given point, she can approach this goal with either a commitment focus (e.g., "is this weight loss goal the right goal for me?") or a progress focus ("am I making enough progress on my weight loss goal?"). Importantly, these commitment and progress representations have distinct implications for goal prioritization.

Commitment Representation of Goals

When people adopt a commitment representation of their goals, goal-related input and actions are interpreted and evaluated in terms of their relevance for goal commitment. Inputs and actions that suggest strong commitment lead to prioritizing the focal goal over other goals (Fishbach et al., 2014; Fishbach, 2022; Fishbein & Ajzen, 1974; Liberman & Forster, 2008; Vroom, 1964). For instance, if Taylor adopts a commitment representation, reflecting on her daily attendance at the gym this past week will increase the likelihood of continuing to engage in this goal (e.g., by going to the gym again on Friday).

This pattern has theoretical roots in expectancy-value theories of motivation (Feather, 1982; Lewin et al. 1944; Tolman, 1955; Vroom, 1964). These classic approaches to motivation have established that commitment to a goal is determined by the product of the goal's perceived value and the expectancy of attaining it. Under a commitment representation, past goal-congruent actions serve as evidence of both the goal's value and its attainability, thereby reinforcing commitment to pursuing it (Fishbach et al., 2009).

The commitment representation also draws on self-perception theory (Bem, 1972), cognitive dissonance theory (Festinger, 1957), and regulatory engagement theory (Higgins, 2006; Higgins & Scholer, 2009). Self-perception theory suggests that individuals infer their attitudes and preferences by observing their own behaviour. When adopting a commitment frame, people observe their existing goal-related actions and infer a strong underlying commitment to the goal, which then guides future behaviour. Similarly, cognitive dissonance theory proposes that people strive for consistency between their actions and beliefs. Initial investment in a goal creates pressure to justify that investment through continued pursuit, a process commonly referred to as the sunk-cost fallacy (Arkes & Blumer, 1985). However, rather than representing a possible error in judgement, this tendency demonstrates a fundamental aspect of self-regulation: goal-related actions increase commitment to the goal and motivate further goal-congruent actions. Regulatory engagement theory further supports this by showing how engagement experiences create values that motivate continued pursuits (Higgins, 2006). Past goal-congruent actions thus signal not just commitment strength, but also the value derived from engagement, thereby reinforcing continued goal pursuit.

Notably, commitment representations connect to goal shielding processes wherein commitment to one goal inhibits the accessibility of competing goals (Fishbach & Zhang, 2009;

Shah et al., 2002). When goal-congruent actions are interpreted as signals of strong commitment to the goal, they can trigger these goal shielding mechanisms that help protect the focal goal from the potential interference of other goals. This process—often referred to as highlighting—helps explain why, under a commitment representation, people tend to prioritize the focal goal over other goals after reflecting on past goal-congruent actions (Fishbach & Dhar, 2005; Fishbach et al., 2006).

Progress Representation of Goals

When people adopt a progress representation of their goals, goal-related inputs and actions are interpreted and evaluated in terms of their relevance for goal progress. Inputs and actions that suggest high progress can lead to prioritizing *other* goals over the focal goal, given that sufficient progress has been made (Carver & Scheier, 1998; Fishbach et al., 2014; Fishbach, 2022; Fulford et al., 2010; Locke & Latham, 1990; Miller et al., 1960). Accordingly, if Taylor adopts a progress representation, reflecting on her daily attendance at the gym this past week will suggest high progress, increasing the likelihood of focusing on other goals (e.g., she may feel like she earned a day off and an indulgent treat with her friends on Friday).

The progress representation is grounded in cybernetic control theories of self-regulation. For instance, Carver and Scheier's (1998) control theory model describes self-regulation as a feedback loop process where individuals compare their current state to a desired end-state and adjust behaviour accordingly. Similarly, Powers' (1973) perceptual control theory emphasizes the role of feedback in guiding goal-directed behaviour. Thus, under a progress representation, existing goal-congruent actions signal that the discrepancy between the current and desired end-state is being reduced, which can temporarily decrease motivation for the focal goal and redirect attention to other goals.

Notably, when operating under a progress representation, the strength of motivation is determined by the size of the discrepancy between one's current and desired end state (Carver & Scheier, 1998; Higgins, 1997; Locke & Latham, 2002). Self-discrepancy theories have established that perceived discrepancies between one's current and desired states create tension that motivates action to reduce these discrepancies (Higgins, 1987). Similarly, goal-setting theory emphasizes that specific, challenging goals create motivational tension until they are achieved (Locke & Latham, 1990, 2002). When individuals adopt a progress representation, this discrepancy-reduction dynamic becomes particularly salient.

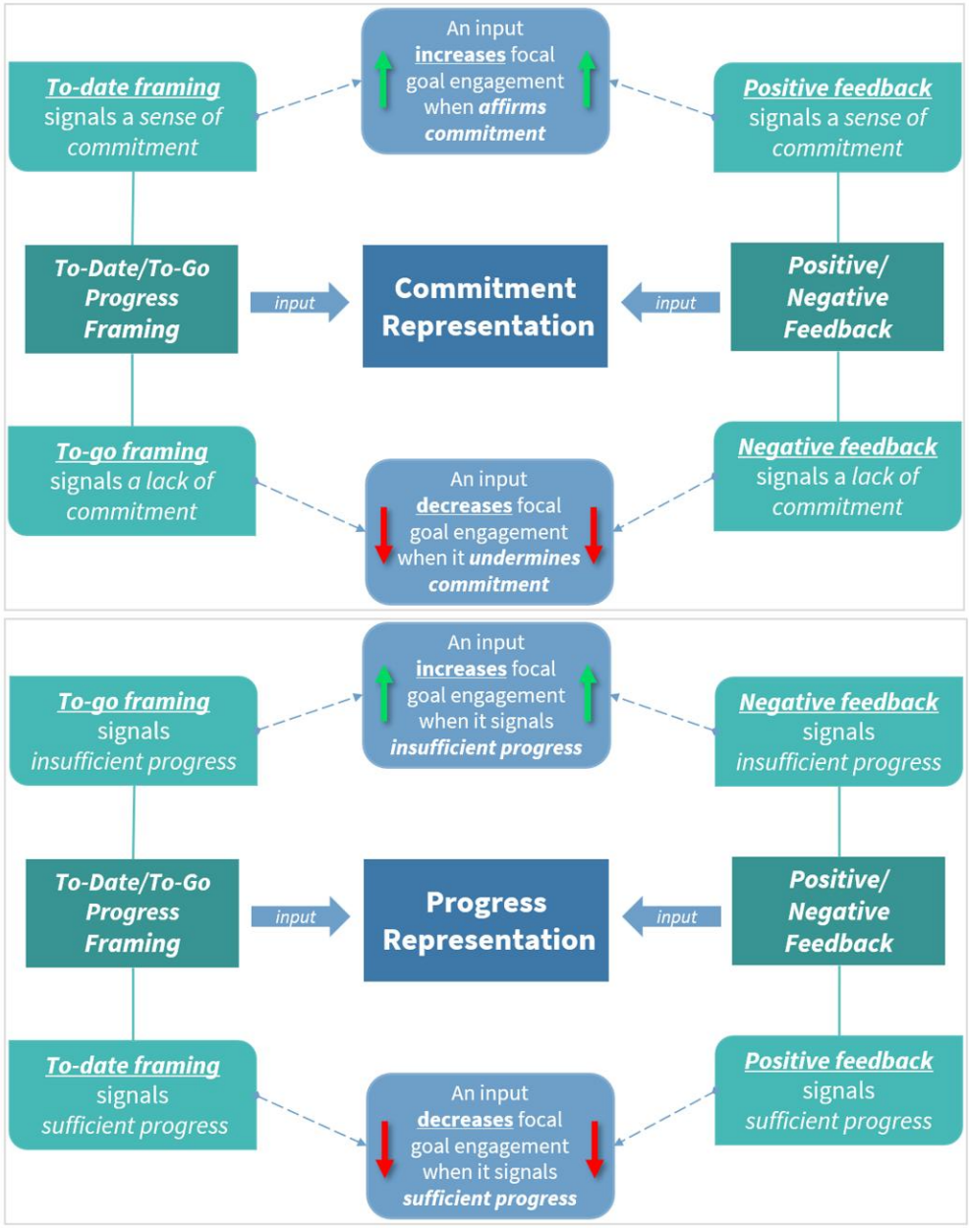
This focus on discrepancy is also relevant in the classis goal-gradient hypothesis proposed by Hull (1932), which suggests that motivation increases as individuals move closer to their goal. However, research also suggests that while proximity to goal completion can increase motivation, the perception of sufficient progress can also trigger a balancing response, especially when multiple goals are competing for limited resources (Kivetz et al., 2006; Heath et al., 1999). Thus, when people adopt a progress representation of their goals, they are sensitive to this balancing dynamic in which goal-related actions can lead people to feel that sufficient progress has been made on the focal goal and thus their effort can now be directed elsewhere (Carver & Scheier, 1998; Locke & Latham, 1990; Miller et al., 1960).

In sum, these commitment and progress representations have significant implications for whether the same objective input (e.g., thinking about going to the gym every day this past week) leads to increased or decreased focal goal engagement. Existing research has identified two types of input that can increase or decrease focal goal engagement and motivation, depending on progress or commitment concerns: 1) to-date and to-go goal progress framing, and 2) positive and negative feedback (see Figure 1). My dissertation focuses on goal progress

framing, though I will also briefly review work in the Introduction that I have conducted on positive/negative feedback.

Figure 1

Commitment and Progress Representations of Goals



Note. This dissertation is focused on to-date/to-go progress framing; a separate manuscript currently in preparation addresses positive/negative feedback (Ross et al., unpublished data).

To-Date and To-Go Framing Interact with Commitment to Influence Motivation

During goal pursuit, people have the option to think about their goal progress in distinct ways. In particular, people can either think about their current progress toward a goal in terms of accumulated (to-date) or remaining (to-go) progress (Fishbach et al., 2009; Koo & Fishbach, 2008). Research suggests that commitment strength is one factor that determines whether people adopt a commitment or progress representation of their goal-related actions. Commitment refers to people's psychological investment in a goal: their willingness to engage in goal-directed effort (Klein et al., 2014; Locke & Latham, 1990). Those whose commitment is stronger should be more likely to invest effort. Past work has highlighted two facets or indicators of commitment strength: the magnitude of one's commitment as well as how certain one is that they are pursuing a worthwhile goal (Koo & Fishbach, 2008).[1] Experiencing greater commitment and/or greater certainty in one's commitment should increase the likelihood of investing goal-directed effort. Both facets of commitment strength have been shown to impact how information about progress to-date (existing goal-related actions) or progress to-go (remaining goal-related actions) is interpreted (Koo & Fishbach, 2008; see Figure 1).

If commitment is weak, people tend to adopt a commitment representation, as their primary goal is to evaluate whether the goal is important and worthwhile. Consequently, thinking about progress to-date is especially likely to motivate focal goal engagement because it signals and amplifies commitment to the goal, whereas focusing on progress to-go is less likely to

[1] One can draw parallels between commitment strength and attitude strength. The attitudes literature suggests that although various indicators—including attitude extremity/magnitude and certainty—are associated with attitude strength (attitudes that are durable, resistant to persuasion, and predict behavior), they are not always correlated nor do they load on a single latent factor (Petty & Krosnick, 1995). Instead, they appear to predict different outcomes in different contexts. Strong attitudes tend to be characterized by the presence of one or more of these indicators. It is possible the same is true of commitment strength: there may be more than one indicator of commitment strength (e.g., magnitude, certainty) which may or may not be correlated, yet may still predict goal-directed effort.

motivate focal goal engagement because it signals a lack of commitment (Fishbein & Ajzen, 1974; Liberman & Forster, 2008; Vroom, 1964). On the other hand, if commitment is strong, people do not need to evaluate whether the goal is important, and thus will adopt a progress representation in which their focus is on evaluating whether they are making sufficient progress. Accordingly, thinking about progress to-go is particularly likely to increase focal goal engagement because it signals insufficient progress and motivates people to reduce the discrepancy between their current and desired end-state (Carver & Scheier, 1998; Thürmer et al., 2020), whereas focusing on progress to-date is less likely to encourage further goal engagement because it signals sufficient progress is being made. In other words, to-date progress framing is most beneficial when people have a commitment representation of their goals, whereas to-go progress framing is most beneficial when people have a progress representation of their goals (Koo & Fishbach, 2008).

Building on this conceptual framework, research has established that goal progress framing and commitment interact to influence motivation, such that to-date framing increases motivation when goal commitment is weak, but to-go framing increases motivation when goal commitment is strong. This relationship has been demonstrated in a number of studies in which researchers experimentally manipulated whether participants were presented with to-date versus to-go framing information. For instance, Koo and Fishbach (2008) asked undergraduate students to imagine that they were midway through the process of studying for two upcoming exams: one in a core course, to which their commitment was strong, and one in an elective course, to which their commitment was relatively weaker. Participants were shown a chart that represented their current level of studying progress on one of these exams in either a to-date or to-go frame. Then, as an index of motivation, participants were asked to report how much time and effort they

would put into studying for the exam. The results showed that to-date and to-go framing had opposite effects on motivation for strong and weak commitment goals: to-date (relative to to-go) framing increased students' motivation to study for the weak commitment elective course exam, and to-go (relative to to-date) framing increased motivation to study for the strong commitment core course exam.

This interaction of to-date/to-go progress framing and goal commitment has been replicated using a variety of goals, including participation in a frequent-buyer loyalty program (Koo & Fishbach, 2008, Study 2), participation in a group goal to show school spirit (Koo & Fishbach, 2008, Study 3), reduction of problematic internet usage (Dunbar et al., 2018), and retention of status in a multi-tier loyalty program (Yu et al., 2022). Research has also demonstrated that the optimal match of commitment strength and progress framing (i.e., strong commitment and to-go framing; weak commitment and to-date framing) is associated with goal-directed behaviour including greater effort investment in an experimental task (Lee, 2016) and real-world contributions to charitable fundraising initiatives (Koo et al., 2021; Koo & Fishbach, 2008, Study 3).

Notably, research in motivation science highlights the importance of considering *where* one is in goal pursuit for understanding the ebbs and flows of motivation, which has implications for to-date and to-go progress framing (e.g., Forster et al., 1998; Hull, 1932; Kivetz et al., 2006). While pursuing a goal, people monitor their progress by comparing to reference points (e.g., Carver & Scheier, 1998; Higgins, 1987; Locke & Latham, 1990), and the motivational impact of these comparisons varies depending on where they are positioned in goal pursuit. Specifically, Heath et al. (1999) demonstrated that the perceived marginal value of goal-related behaviour changes depending on where one is in goal pursuit and the reference point that is used,

influencing motivation to further engage in that behaviour. For instance, early in goal initiation people are particularly motivated by focusing on progress from the starting line, whereas as they approach goal completion, people are particularly motivated by focusing on progress from the finish line. This is because the perceived marginal value of progress is greater when the distance from the reference point is smaller (i.e., the "small area principle"; Bonezzi et al., 2011; Fishbach, 2022; Heath et al., 1999). One resulting implication is a U-shaped gradient of motivation such that mid-way through goal pursuit, motivation is particularly likely to sag, coined the "stuck in the middle" effect (Bonezzi et al., 2011). This poses an interesting self-regulatory problem—given that the starting and finish lines are relatively equidistant—as to which reference point people should use to sustain their motivation. The research by Fishbach and colleagues suggests that the answer to this question depends on one's representation of goal-related actions (Fishbach et al., 2009; Koo & Fishbach, 2008). Importantly, this highlights the possibility that a strategic focus on progress to-date vs. progress to-go may be particularly important when people are in the middle of goal pursuit, as this is when motivation is often at its lowest and thus would benefit the most from a strategy to upregulate motivation quantity.

Positive and Negative Feedback

Feedback on goals—information regarding how we are faring in relation to our desired outcomes—plays an essential role during goal pursuit, providing valuable information that guides goal-directed behaviour (Bandura, 1991; Carver & Scheier, 1998; Dweck & Leggett, 1988). Positive feedback provides information that a goal or standard is being met or exceeded, whereas negative feedback provides information that the current state falls short. Although negative feedback is often theorized to be especially useful for guiding goal investment and pursuit (Johnson et al., 2006; Schmidt & DeShon, 2007; Vancouver et al., 2010), both positive

and negative feedback can be more or less effective for increasing focal goal engagement, depending on whether people adopt a commitment or a progress representation (Fishbach et al., 2010).

When individuals adopt a commitment representation, positive feedback is especially likely to motivate focal goal engagement because it increases one's sense of personal commitment by inferring that the goal is worthwhile and attainable (Bandura, 1991; Fishbein & Ajzen, 1974; Markman & Brendl, 2000; Vroom, 1964). Conversely, negative feedback is less likely to motivate focal goal engagement because it signals a lack of goal commitment. When people adopt a progress representation, negative feedback is especially likely to motivate focal goal engagement because it signals insufficient progress and the need for more effort towards the focal goal (Carver & Scheier, 1998; Higgins, 1987; Powers, 1973). Conversely, positive feedback is less likely to motivate focal goal engagement because it signals sufficient progress has been made. In other words, positive feedback is most beneficial when people have a commitment representation of their goals, whereas negative feedback is most beneficial when people have a progress representation of their goals (Fishbach et al., 2010).

In sum, research has established that both goal progress framing and positive and negative feedback serve as inputs that can increase or decrease focal goal engagement and motivation, depending on progress or commitment concerns (Fishbach et al., 2009, 2010, 2014). Although these inputs share some conceptual overlap (i.e., positive and negative feedback are conceptually akin to information about progress to-date and progress to-go, respectively), they are distinct domains with unique implications for motivation regulation and goal pursuit that deserve dedicated lines of research. My dissertation research focuses on to-date and to-go progress

framing, though I have also examined people's metamotivational beliefs about positive and negative feedback, which I review below.

Metamotivation

The research discussed thus far suggests there are benefits for goal pursuit when people strongly committed to a goal are exposed to to-go progress framing and people weak in commitment to a goal are exposed to to-date progress framing (e.g., Fishbach et al., 2009; Koo & Fishbach, 2008; Yu et al., 2022). An individual who recognizes that to-date and to-go framing influence motivation differently for weak and strong commitment goals could therefore strategically focus on to-date or to-go progress to encourage goal engagement (Fishbach, 2021). Yet, although existing research demonstrates the effects of to-date/to-go progress framings when researchers experimentally manipulate them, it is not known if people recognize when and how to flexibly deploy progress framings to support motivation.

Research on metamotivation—the processes by which people monitor and control their motivational states—highlights the important role that people's beliefs about motivation regulation play in goal pursuit (Miele & Scholer, 2018; Miele et al., 2020). Across several motivational domains, research has demonstrated that people vary in the normative accuracy of their knowledge regarding how to optimally manage their motivational states (Fujita et al., 2024; Miele et al., 2020, 2024; Scholer et al., 2018; Wolters, 2003). This research, which builds on work in self-regulated learning examining the size or scope of one's motivational strategy repertoire (Sansone et al., 1992; Schwinger & Stiensmeier-Pelster, 2012; Wolters, 2003, 2011; Wolters & Benzon, 2013), has highlighted the importance of motivational beliefs reflecting if-then contingencies—knowing which strategies to use *when*. Notably, the metamotivational approach recognizes that, while the language used to discuss these processes might imply that

they are carried out in a conscious and deliberate manner (Miele et al., 2024), the monitoring and control of these beliefs can often be relatively tacit or implicit (Reber, 1989; Wagner, 1987; Wagner & Sternberg, 1985).

The metamotivation framework highlights that people can regulate both motivation quantity (i.e., how much motivation one has) and motivation quality (i.e., the type of motivation one has). Much recent work in metamotivation has focused on the nature of people's beliefs about regulating motivation quality. Specifically, much of this work has examined people's beliefs about task-motivation fit—optimally aligning qualitatively different motivational states with distinct task demands (e.g., upregulating eager motivation for a creativity task and vigilant motivation for a surveillance task; Scholer & Miele, 2016). This works suggests that, on average, people tend to hold normatively accurate metamotivational beliefs (also referred to as having "metamotivational knowledge") regarding which motivational state will work best for a given task, including eager versus vigilant states (Scholer & Miele, 2016), high- versus low-level construals (Nguyen et al., 2019, 2020, 2022), and intrinsic versus extrinsic states (Hubley et al., 2024). At the same time, there is significant variability in the normative accuracy of these beliefs (Miele et al., 2020), and clear instances where people's beliefs fail to align with normative evidence. For instance, people fail to recognize that extrinsic incentives can undermine intrinsic motivation (Murayama et al., 2016) or underestimate the broader value of intrinsic motivation beyond the immediate activity itself (Woolley & Fishbach, 2015).

Prior research indicates that the normative accuracy of people's metamotivational beliefs influences behaviour and performance. Normatively accurate metamotivational beliefs in the domains of regulatory focus, construal level theory, and self-determination have been shown to significantly predict consequential behavioural choices (Hubley et al., 2024; Nguyen et al.,

2019), as well as performance on laboratory tasks (Hubley et al., 2024) and in real-world settings (e.g., performance in an undergraduate psychology course; MacGregor et al., 2017; Nguyen et al., 2022; Ross et al., 2023). Investigating people's beliefs about motivation regulation thus provides new insights into when and why goal pursuit may be effective versus ineffective.

This framework has been applied to understanding people's metamotivational beliefs about positive and negative feedback in relation to commitment or progress representations[2] and whether these beliefs predict goal success and well-being (Ross et al., unpublished data). I found that, on average, participants' beliefs reflected an understanding of the benefits of both types of feedback, though there was significant variability in these beliefs as well as evidence that participants might have stronger sensitivity to the utility of positive feedback. This work also provided some evidence that those with more normatively accurate beliefs made greater goal progress on the goals they cared more (vs. less) about. For my dissertation, I focus on exploring the other key input that influences motivation under commitment and progress representations: to-date and to-go progress framing.

Metamotivational Beliefs about To-Date and To-Go Progress Framing

The goals of my dissertation are to examine 1) the nature and normative accuracy of people's metamotivational beliefs of to-date/to-go progress across various contexts, and 2) whether and when these beliefs manifest in or are related to behavioural and self-regulatory outcomes.

Exploring whether people recognize the differential effects of to-date and to-go progress framing is an important question, as people frequently have opportunities to consider goal status

[2] Some related work on expertise (Finkelstein et al., 2017; Finkelstein & Fishbach, 2012) also hints at the idea that people may be sensitive to these dynamics. As people gain expertise (and presumably greater commitment), they are more likely to seek out negative versus positive feedback.

from different vantage points. For instance, opportunities to make these kinds of choices occur naturally every day through one's subjective construals of their goals (e.g., during a marathon), and they are also evident in popular planning and health apps such as *Notion* and *Zero*, where users are making explicit decisions about things like progress tracking and framing.

Further, examining metamotivational beliefs about progress framing not only represents a novel application of the metamotivational framework, but goes beyond recent metamotivation research in two ways by a) looking at the normative accuracy of if-then beliefs for regulating motivation *quantity* (versus quality), and b) examining beliefs about regulating motivation in response to an *internal* (versus external) signal. Extant work on task-motivation fit has focused on people's beliefs about regulating qualitative differences in motivation based on external task signals. In contrast, I posit that people may also vary in their beliefs about the regulation of motivational quantity based on signals about an internal state (goal commitment). Miele and Scholer (2018) argue that internal signals—such as confidence, meaningfulness, and hope—play an important role in metamotivational monitoring: these and other "metamotivational feelings" can signal one's level of motivation and indicate the need to monitor and regulate one's motivational state. The study of metamotivational beliefs in the to-date/to-go domain permits the exploration of how, or if, people recognize goal commitment as a relevant input for framing current levels of progress.

Finally, examining beliefs in this domain offers a unique challenge in that, unlike other motivational domains that have been studied, these beliefs might be particularly relevant at specific phases of goal pursuit, which may make it harder to capture a relationship between beliefs and outcomes. As I have alluded to, it is possible that a strategic focus on progress to-date versus progress to-go may be particularly important when people are in the middle of goal

pursuit, as this is when motivation is often at its lowest and thus would benefit the most from a strategy to upregulate motivation quantity (Bonezzi et al., 2011). Thus, in contrast to metamotivational beliefs about regulatory focus or construal level—which often have the opportunity to be relevant during the various stages of goal pursuit and have been shown to be related to outcomes—beliefs in this domain may potentially be more constrained in when they are going to be relevant for goal pursuit, which might have implications for capturing whether normative accuracy of beliefs relates to self-regulatory outcomes.

The Present Studies

The present research aims to address several unanswered questions regarding people's metamotivational beliefs about to-date and to-go progress framing. First, prior research has yet to explore people's metamotivational beliefs regarding how to effectively apply to-date/to-go framing in response to differing levels of goal commitment. To address this question, Studies 1 and 2 developed and tested a scenario-based beliefs assessment modeled after past work assessing beliefs in other motivational domains (Nguyen et al., 2019, 2022; Scholer & Miele, 2016). Studies 3-5 then explored whether people's beliefs are reflected in their behaviour by examining people's consequential choices for real-life goals, including personal goals (Study 3) and in experimentally controlled settings (Studies 4-5). Finally, Studies 6 and 7 investigated whether normatively accurate beliefs about progress framing are associated with self-regulatory outcomes, including goal progress and success (Study 6) and broader goal-related experiences in daily life and personal strivings (Study 7).

Statistical Power and Data Quality

Power analyses are reported in the methods section for each study. Given that the study materials required attention to subtle differences in language, I made an a priori decision to exclude a subset of participants across all studies. Specifically, participants who reported not paying attention (i.e., reported being "very" or "extremely" distracted or taking the study "not at all" or "a little" seriously) were excluded across analyses. Exclusions did not change the interpretation of any results.

Further, in all studies, participants were given an attention check question immediately after the information consent letter (Oppenheimer et al., 2009) to help maximize data quality. Participants were given a large block of text to read that described irrelevant information about

decision-making but included instructions for an open-ended question that followed. Specifically, participants read the following passage:

> *"Recent research on decision making shows that choices are affected by context. Differences in how people feel, their previous knowledge and experience, and their environment can affect choices. To help us understand how people make decisions, we are interested in information about you. Specifically, we are interested in whether you actually take the time to read the instructions; if not, some results may not tell us very much about decision making in the real world. To show that you have read the instructions, please ignore the question below about how you are feeling and instead type in "I read the instructions." You must answer this question correctly in order to participate in this study.*
>
> *Please briefly describe how you are feeling right now."*

Participants needed to notice the alternate instructions found in the passage and answer this question with "I read the instructions" to be able to continue with the rest of the study (see Oppenheimer et al., 2009). By getting participants to carefully read the passage and notice the alternate instructions, the question helps to ensure participants read the instructions carefully throughout the rest of the study. Because participants needed to answer the question correctly before proceeding to the materials of the study, this question did not lead to the exclusion of any participants. Studies that were conducted through Amazon's Mechanical Turk (MTurk, hosted by CloudResearch) included some additional strategies to help ensure data quality, using built-in features of the platform. Specifically, participants were required to be "CloudResearch approved," to have 100+ HITs approved, and to have a HIT approval rate of 95% or higher.

Study 2b was preregistered on the Open Science Framework (OSF) and is available at https://osf.io/kzf8j/?view_only=e6420445473543ed9174efd6502e0f0e. Analysis plans for Studies 3c, 3d, and 5 were also preregistered on OSF and can be found in Appendix A.

Study 1

Study 1 was an initial exploration of people's metamotivational beliefs about to-date and to-go progress framing. I conducted three studies to compare different belief assessment approaches, assessing beliefs: a) in the context of motivating the self (N = 195), b) in the context of motivating someone else (N = 199), and c) manipulating whether a focus on progress was made salient or not (N = 273). The development and testing of these assessments was modeled after past work assessing beliefs in other motivational domains (Hubley et al., 2024; Jansen et al., 2022; Nguyen et al., 2019, 2022; Scholer & Miele, 2016). In the assessment, participants read a series of hypothetical scenarios describing goals in various domains (e.g., health, financial, personal, etc.) in which the imagined commitment to the goal was manipulated to be high and certain ("strong" commitment), or relatively uncertain ("weak" commitment). For each scenario, participants were presented with two progress framing options: one that emphasized how much progress had been made so far ("to-date" information) and one that emphasized how much progress was left to go ("to-go" information). Participants were asked to choose which of the two options they thought would be most motivating for achieving the goal (a binary outcome) and separately rated how motivating each option would be (a continuous outcome). If individuals exhibit normatively accurate beliefs, they should perceive to-date information as more motivating for weak commitment scenarios and to-go information as more motivating for strong commitment scenarios.

As noted above, the primary aim of Study 1 was to explore people's beliefs about the motivational effects of to-date and to-go progress framing. Assessments of metamotivational beliefs in other motivational domains have primarily measured beliefs in the context of motivating the self. Thus, Study 1a tested an assessment parallel to these prior metamotivation

assessments by measuring people's beliefs about to-date and to-go progress framing for their own hypothetical goals. However, there could be factors that influence how these beliefs manifest. Thus, an additional aim of Study 1 was to explore whether addressing these factors resulted in a different manifestation of beliefs.

Study 1b assessed people's metamotivational beliefs in the context of motivating someone else. Decades of work suggest that, in certain circumstances, there can be biases or gaps in our self-knowledge regarding our personality, intelligence, and abilities (Hofer et al., 2022; Neubauer & Hofer, 2022; Vazire, 2010; Zell & Krizan, 2014). It is possible, then, that metamotivational beliefs could differ for self versus other. Recent research examining manager's regulatory focus metamotivational beliefs provides some support for this possibility, as researchers found that beliefs about how to motivate someone else were only moderately correlated with their beliefs regarding how to best motivate themselves (Jansen et al., 2022). Assessing beliefs for self and other thus provides a richer window into how people think about motivating themselves and others in this domain, offering valuable insights for both the development of the assessment as well as for those who are tasked with the challenge of managing or influencing the motivation of others.

Study 1c manipulated whether concerns with goal progress were particularly salient or not. According to prior research on goal dynamics, people adopt either a commitment or progress representation of their goals, depending on their level of commitment (Koo & Fishbach, 2008). Accordingly, I designed the assessments in Study 1a and 1b to manipulate perceptions of commitment strength. However, it is possible that assessing beliefs in this manner is failing to sufficiently allow participants to tap into a "progress representation"—that is, when goal commitment is strong, the primary concern is whether one has made enough progress, which

makes to-go representations more motivating because they directly address these concerns (Carver & Scheier, 1998; Locke & Latham, 1990). The versions of the beliefs assessment used in Studies 1a and 1b did not explicitly indicate a concern with progress. Thus, Study 1c addressed whether and how metamotivational beliefs manifest differently when concerns with progress were made salient (vs. not).

In sum, the aims of Study 1 were to provide an initial exploration of people's metamotivational beliefs about to-date and to-go progress framing, as well as explore whether these beliefs manifest differently across various measurement approaches. Given that existing metamotivation research has demonstrated that people tend to hold normatively accurate beliefs across a variety of motivational domains, it is reasonable to expect that people's beliefs of to-date and to-go progress framing might also be normatively accurate. However, this work has also revealed that there is substantial variability in the normative accuracy of people's beliefs, as well as evidence of strong biases and preferences that result in inaccuracies in people's metamotivational knowledge (Scholer & Miele, 2016), suggesting that individuals might also exhibit inaccuracies in their beliefs. I had no strong a priori predictions regarding whether beliefs would manifest differently across the various measurement approaches.

Study 1a

Method

Participants. Undergraduate participants (N = 195) completed an online study in exchange for course credit. After exclusions, there was a final sample size of N = 191 (M_{age} = 20.40, SD_{age} = 4.76; 147 women/transwomen, 40 men/transmen, 3 gender variant/non-conforming/other, 1 did not report; 30.9% East Asian, 29.8% White, 25.1% South Asian, 4.7% mixed racial/ethnic identity, 4.7% Black, 3.1% Middle Eastern, 1% Hispanic/Latinx, 0.5% did

not report). To determine estimated sample sizes, I conducted a priori power analyses in G*Power. The power analyses for Study 1 were based on conducting ANOVA analyses. The analysis showed that a sample size of 116 would provide 99% power to detect a small effect size of f=0.10 at the standard alpha error probability for my primary analysis: a repeated measures ANOVA with 16 measurements (I treated commitment type as a between-participants variable given that G*Power does not currently support testing this type of repeated measures interaction; thus, this may be a conservative estimate). To account for potential exclusions and the possibility of smaller effect sizes, I aimed to recruit at least 150 participants. Although I had originally conducted the power analyses for Study 1 based on ANOVA analyses, I ultimately determined that the most appropriate analyses to conduct for these studies were mixed-effects models, likely making these power estimates conservative.[3]

Procedure and Materials. Participants were told that this was a study investigating motivation. Specifically, in the preamble, participants read that people might use certain strategies to motivate themselves such as thinking about the same goal in different ways, including considering how much they have done so far or how much they have left to go. They were then told that they would be asked to imagine that they were pursuing goals in several scenarios and to respond to a few questions for each scenario.

To assess participants' metamotivational beliefs of to-date/to-go progress framing, participants completed a scenario-based metamotivational beliefs assessment. Participants read

[3] This approach to power analysis, while not ideal given the limitations of available tools, was my best attempt to appropriately estimate power for the complex design given the constraints of current power analysis software. For studies with these complex multilevel models analyses, I did explore simulation-based approaches (e.g., the simr package in R) but encountered convergence issues, which is a common experience reported by researchers working with these models (Green & MacLeod, 2016; Brysbaert & Stevens, 2018). I believe the approach I used represents a reasonable compromise given these methodological constraints, while still ensuring adequate power for my primary analyses.

eight hypothetical goal scenarios in various domains (e.g., reading, volunteering, fundraising for charity, saving money, eliminating debt, career, learning, health). The level of commitment to the goal was manipulated within-participants, such that participants saw a "strong commitment" and "weak commitment" version of all eight scenarios. Consistent with prior work in this area (Koo & Fishbach, 2008), level of goal progress was held constant near the midpoint at around 48% to avoid confounding progress framing with size of discrepancy and to make it less likely for participants to reverse the framing in their minds (i.e., framing 50% to-date as 50% to-go).

For example, in a scenario where participants imagined having strong commitment [weak commitment] to a goal of saving money to purchase a new vehicle, they read the following text:

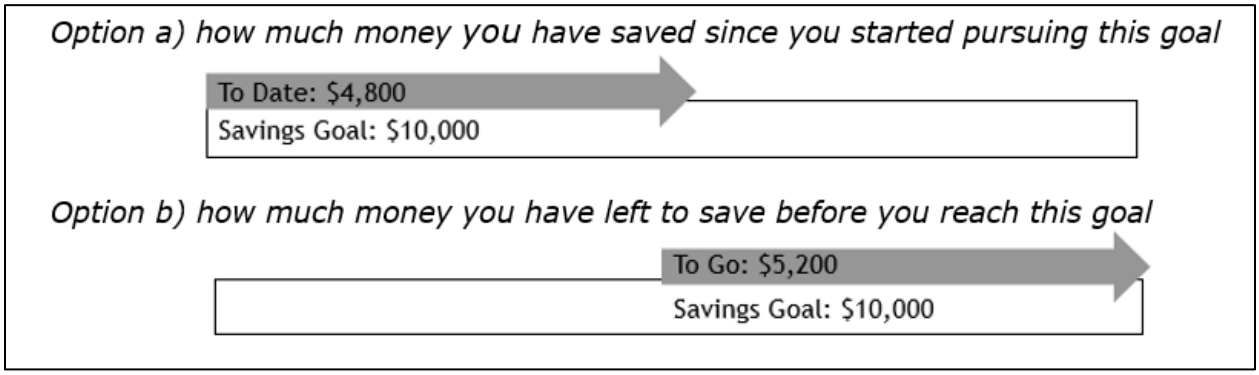
> "Imagine that you are saving money to buy a new car worth $10,000, **and you are very committed to this goal** [*weak commitment:* ***but you are not sure how committed you are to this goal***]. You have many other financial responsibilities, **but are certain this is a top priority right now** [*weak commitment:* ***and you are not certain if this is a top priority right now***]. At this point, you have saved $4800."

After reading the scenario, participants were asked whether they would rather focus on how much progress they have made so far or how much progress they had left to go in order to motivate themselves to achieve the goal. Modeled after materials used by Koo and Fishbach (2008), each option also included a visual representation of the goal progress, which included a bar representing the goal and an arrow representing the current level of goal progress. For the to-date framing option, the arrow began at the starting point and ended at the current level of progress (roughly half-way), whereas for the to-go framing option, the arrow began at the current level of progress (roughly half-way) and ended at the end point of the bar (see Figure 2). Participants also rated the extent to which they thought each option would be motivating for

them to focus on, on a scale from 1 (*extremely demotivating*) to 7 (*extremely motivating*). After completing the assessment, participants also reported how relevant and important each of the eight goal domains were in their own lives.[4] The complete text for the metamotivational beliefs assessment, along with additional measures unrelated to the current research question, are available in Appendix C and Appendix B, respectively.

Figure 2

To-Date/To-Go Metamotivational Beliefs Assessment: Progress Framing Option Visualizations



Results

Analyses in Studies 1a-1c used mixed-effects models to account for the random effects of participants and scenarios by estimating random intercepts for each. The *glmer* function was used to test generalized mixed models for binary outcomes from the lme4 package in R (Bates et al., 2015) and the *lmer* function was used to test linear mixed models for continuous outcomes.

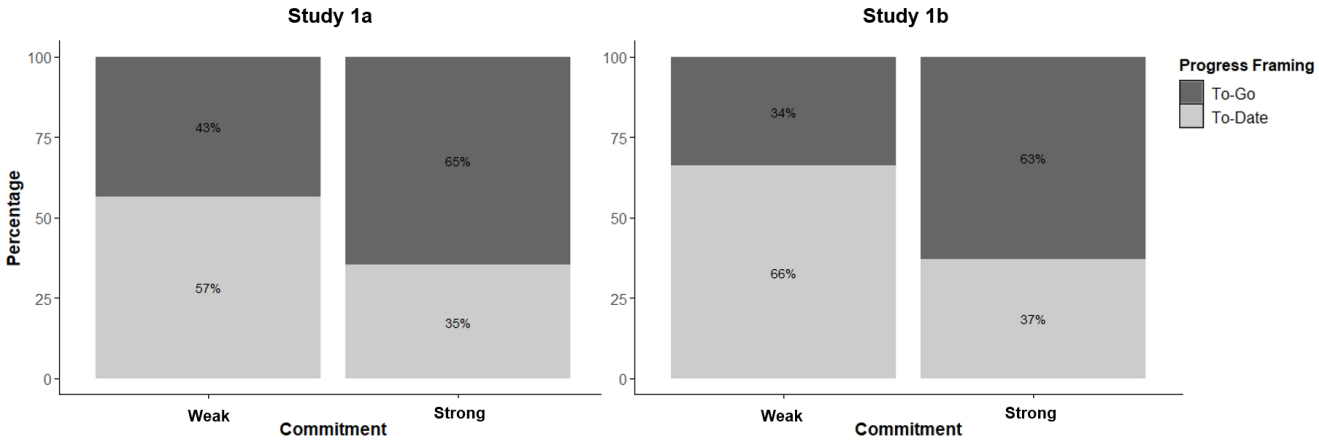
Beliefs Assessment: Binary Choice. Participants' binary choices were coded such that 0 indicated to-date and 1 indicated to-go. The binary choice variable was regressed onto commitment (-1 = weak commitment, 1 = strong commitment) using a mixed-effects logistic

[4] Exploratory analyses revealed that these factors did not change the pattern of results, both in the present study and in the subsequent studies in my dissertation using the beliefs assessment. Therefore, it will not be discussed further.

regression model. Results revealed that 65% of participants chose to-go for strong commitment scenarios, compared to 43% who chose to-go for weak commitment scenarios; this corresponds to significantly higher odds of choosing to-go for strong commitment versus weak commitment scenarios, OR = 1.62, $z = 12.13$, $p < .001$, 95% CI [1.52, 1.79] (see Figure 3). Thus, when making a binary choice, participants demonstrated normatively accurate metamotivational beliefs such that they chose to-go versus to-date as the most motivating option for strong versus weak commitment scenarios. At the same time, there was variability in these choices; a substantial proportion of participants were making choices that deviated from normative accuracy.

Figure 3

Percentage of To-Date and To-Go Choices for Weak and Strong Commitment



Beliefs Assessment: Continuous Ratings. The continuous motivation ratings were regressed on commitment (-1 = weak commitment, 1 = strong commitment), progress framing (-1 = to-date, 1 = to-go), and their interaction using a linear mixed-effects model (see Table 1). Results revealed significant main effects of commitment and progress framing. Critically, these main effects were qualified by a significant commitment by framing interaction. See Table 2 for descriptive statistics and Figure 4 for results visualization.

Table 1

Commitment and Progress Framing Predicting Motivation Ratings for Study 1

Study	Predictor	*b*	*SE*	*t*	*p*	[95% CI]
1a	Intercept	4.96	0.06	84.94	<.001	[4.85, 5.08]
	Commitment	0.26	0.02	15.57	<.001	[0.22, 0.29]
	Progress Framing	-0.08	0.02	-5.08	<.001	[-0.12, -0.05]
	Commitment x Progress Framing	0.18	0.02	10.95	<.001	[0.15, 0.21]
1b	Intercept	4.92	0.06	86.08	<.001	[4.81, 5.03]
	Commitment	0.26	0.02	16.32	<.001	[0.23, 0.29]
	Progress Framing	-0.22	0.02	-14.05	<.001	[-0.25, -0.19]
	Commitment x Progress Framing	0.26	0.02	16.18	<.001	[0.22, 0.29]
1c	Intercept	5.03	0.06	80.93	<.001	[4.90, 5.15]
	Commitment	0.25	0.01	17.88	<.001	[0.22, 0.27]
	Progress Framing	-0.07	0.01	-4.97	<.001	[-0.10, -0.04]
	Progress Focus	-0.04	0.05	-0.92	.360	[-0.13, 0.05]
	Commitment x Progress Framing	0.17	0.01	12.50	<.001	[0.15, 0.20]
	Commitment x Progress Focus	0.01	0.01	0.61	.541	[-0.02, 0.04]
	Progress Framing x Progress Focus	-0.01	0.01	-0.80	.425	[-0.04, 0.02]
	Commitment x Progress Framing x Progress Focus	0.03	0.01	2.19	.028	[0.003, 0.06]

Examining simple slopes as a function of commitment revealed that, for weak commitment scenarios, to-date was seen as more motivating than to-go, $b = -0.26$, $p < .001$, whereas for strong commitment scenarios, to-go was seen as more motivating than to-date, $b =$

0.10, $p < .001$. Thus, on average, participants demonstrated normatively accurate beliefs, but as can be seen in Figure 4, there was significant variability in these beliefs. Further, the effect was descriptively larger for the weak commitment scenarios, suggesting that participants might be particularly sensitive to the relative benefits of to-date versus to-go information under weak goal commitment.

Table 2

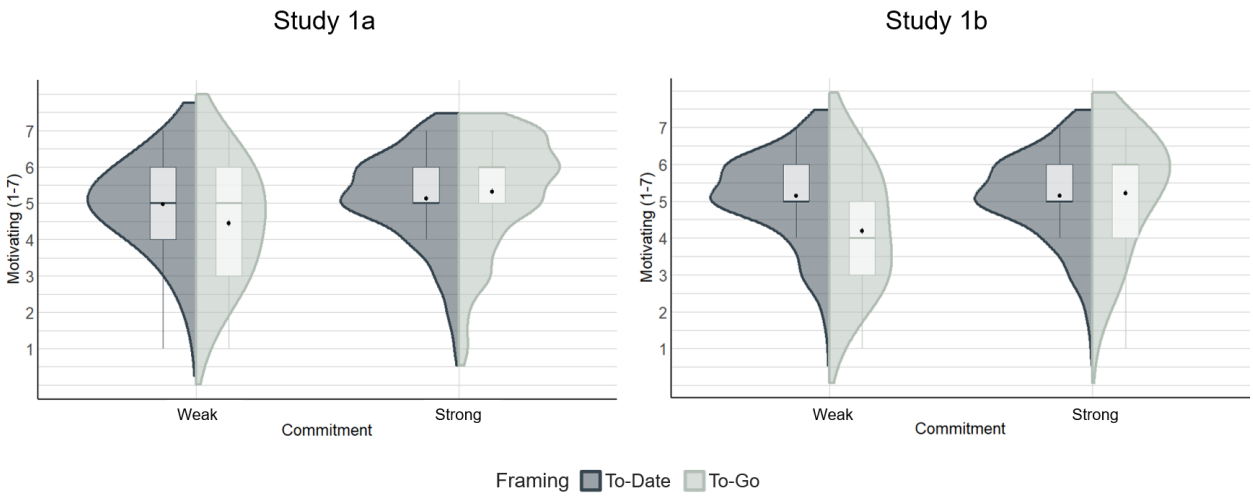
Descriptive Statistics for Study 1

			Motivation Ratings: *M* (*SD*)	
Study			To-Date	To-Go
1a	Weak Commitment		4.97 (0.80)$_a$	4.45 (1.14)$_a$
	Strong Commitment		5.12 (0.91)$_b$	5.32 (1.10)$_b$
1b	Weak Commitment		5.14 (0.80)$_a$	4.19 (1.16)$_a$
	Strong Commitment		5.15 (0.80)$_a$	5.21 (1.14)$_b$
1c	Weak Commitment	No Progress Focus	5.03 (1.20)$_a$	4.63 (1.59)$_a$
	Strong Commitment	No Progress Focus	5.22 (1.20)$_b$	5.39 (1.43)$_b$
	Weak Commitment	Progress Focus	5.01 (1.24)$_a$	4.45 (1.58)$_a$
	Strong Commitment	Progress Focus	5.12 (1.31)$_a$	5.36 (1.43)$_b$

Note: Within each progress framing column, cells not sharing subscripts differ at $p < .05$.

Figure 4

Progress Framing Ratings as a Function of Commitment (Weak vs. Strong) and Progress Framing (To-Date vs. To-Go) for Studies 1a and 1b



Note. Graph represents split violin plots with density distributions of progress framing ratings for weak and strong commitment scenarios, with box plots, descriptive means (black dots) and 95% confidence intervals (black error bars).

Study 1b

Method

Participants. Undergraduate participants (N = 199) completed an online study in exchange for course credit. After exclusions, there was a final sample size of N = 182 (M_{age} = 20.27, SD_{age} = 5.15; 126 women/transwomen, 53 men/transmen, 1 gender variant/non-conforming/other, 2 did not report; 26.4% East Asian, 36.3% White, 19.2% South Asian, 4.9% mixed racial/ethnic identity, 6% Black, 4.4% Middle Eastern, 1.1% Hispanic/Latinx, 0.5% did not report). Consistent with Study 1a, I aimed to recruit at least 150 participants which would provide 99% power to detect an effect.

Procedure and Materials. Participants read a preamble similar to Study 1a that highlighted how thinking about the same goal in distinct ways can be used as a motivational strategy, except that the information was framed in the context of motivating someone else. Specifically, participants read that we are often in positions (e.g., as supervisors, coaches, teachers, etc.) where we can use certain strategies, such as goal progress framing, to motivate others. They were then asked to imagine that they were giving advice to someone else (i.e., "Sam") who was pursuing different goals in several scenarios. For example, using the strong commitment version of the saving money for a new car scenario described in Study 1a:

> "Imagine that ***Sam*** is saving money to buy a new car worth $10,000, and ***they*** are very committed to this goal. ***They*** have many other financial responsibilities, but ***they*** are certain this is a top priority right now. At this point, ***they*** have saved $4800."

After reading the scenario, participants were asked whether they would rather tell Sam to focus on how much progress they have made so far or how much progress they had left to go in order to motivate themselves to achieve the goal, and they rated the extent to which they thought each option would be motivating for Sam to focus on, on a scale from 1 (*extremely demotivating*) to 7 (*extremely motivating*).

Results

Beliefs Assessment: Binary Choice. Participants' binary choices were coded such that 0 indicated to-date and 1 indicated to-go. The binary choice variable was regressed onto commitment (-1 = weak commitment, 1 = strong commitment) using a mixed-effects logistic regression model. Results revealed that 63% of participants chose to-go for strong commitment scenarios, compared to 34% who chose to-go for weak commitment scenarios; this corresponds

to significantly higher odds of choosing to-go for strong commitment versus weak commitment scenarios, OR = 2.00, $z = 15.94$, $p < .001$, 95% CI [1.87, 2.17] (see Figure 3).

Beliefs Assessment: Continuous Ratings. The continuous motivation ratings were regressed on commitment (-1 = weak commitment, 1 = strong commitment), progress framing (-1 = to-date, 1 = to-go), and their interaction using a linear mixed-effects model (see Table 1). Results revealed significant main effects of commitment and progress framing. Critically, these main effects were qualified by a significant commitment by framing interaction. See Table 2 for descriptive statistics and Figure 4 for results visualization.

Examining simple slopes as a function of commitment revealed that, for weak commitment scenarios, to-date was seen as more motivating than to-go, $b = -0.48$, $p < .001$, but unlike Study 1a, there was no significant difference between the two framings for strong commitment scenarios, $b = 0.03$, $p = .131$. Notably, however, this pattern is consistent with the idea from Study 1a that participants may be relatively less sensitive to the differential benefits of to-date and to-go progress framings under strong commitment.

Study 1c

Method

Participants. Undergraduate participants ($N = 273$) completed an online study in exchange for course credit. After exclusions, there was a final sample size of $N = 243$ ($M_{age} = 20.24$, $SD_{age} = 4.23$; 192 women/transwomen, 46 men/transmen, 2 gender variant/non-conforming/other, 3 did not report; 32.1% East Asian, 32.9% White, 23.5% South Asian, 4.5% mixed racial/ethnic identity, 2.5% Black, 2.9% Middle Eastern, 1.6% Hispanic/Latinx).

Participants were randomly assigned to condition in a 2 (commitment: weak vs. strong) x 2 (progress focus condition: no focus on progress vs. focus on progress) design, with the first

factor manipulated within-participants and the second factor manipulated between-participants. In Studies 1a and 1b, an *a prioi* power analysis revealed that 116 participants would provide 99% power to detect an effect (note that this analysis was based on conducting ANOVAs as opposed to multilevel models, and treated commitment as a between-participants factor due to software constraints, thus this may have been a conservative estimate). For Study 1c, which added a between-participants variable to the existing design, I doubled that estimate and aimed to recruit a minimum of 232. To account for potential exclusions and the possibility of smaller effect sizes, the stop rule was to recruit as close to 300 participants as possible before the end of the academic term, depending on the availability of the participants in the participant pool.

Procedure and Materials. Participants were given the same instructions and set of scenarios as in Study 1a. However, this modified version of the beliefs assessment included a between-participants condition in which participants were randomly assigned to have a focus on goal progress made particularly salient or not (i.e., read slightly modified versions that included an additional focus on concerns with progress vs. read the original version of the scenarios as in Study 1a). For example, using the strong commitment version of the saving money for a new car scenario, participants in the focus on progress condition would see the following text, with the bolded and italicized section being the additional text designed to highlight concerns with progress:

> "Imagine that you are saving money to buy a new car worth $10,000, and you are very committed to this goal. You have many other financial responsibilities, but you are certain this is a top priority right now. ***You begin to ask yourself if you have made sufficient progress on the goal.*** At this point, you have saved $4800."

Participants who were in the condition that did not make concerns with progress salient (no focus on progress condition) did not see this additional text in their scenario descriptions. In other words, the beliefs assessment completed by participants in the no focus on progress condition was exactly the same as the assessment participants completed in Study 1a, thereby making this condition a replication of Study 1a.

Results

Beliefs Assessment: Binary Choice. Participants' binary choices were coded such that 0 indicated to-date and 1 indicated to-go. The binary choice variable was regressed onto commitment (-1 = weak commitment, 1 = strong commitment), progress condition (-1 = no focus on progress, 1 = focus on progress), and their interaction using a mixed-effects logistic regression model (see Table 3). Results revealed that 64% of participants chose to-go for strong commitment scenarios, compared to 45% who chose to-go for weak commitment scenarios (see Figure 5), corresponding to significantly higher odds of choosing to-go for strong commitment versus weak commitment scenarios, OR = 2.33, $z = 8.59$, $p < .001$, 95% CI [1.92, 2.83]. However, the main effect of progress focus condition was not significant, indicating that making concerns with progress salient did not significantly influence participants' choices between to-date and to-go framing. Additionally, the interaction between commitment and progress focus condition was not significant, suggesting that the effect of commitment on participants' choices did not differ depending on whether a focus on progress concerns was present or absent.

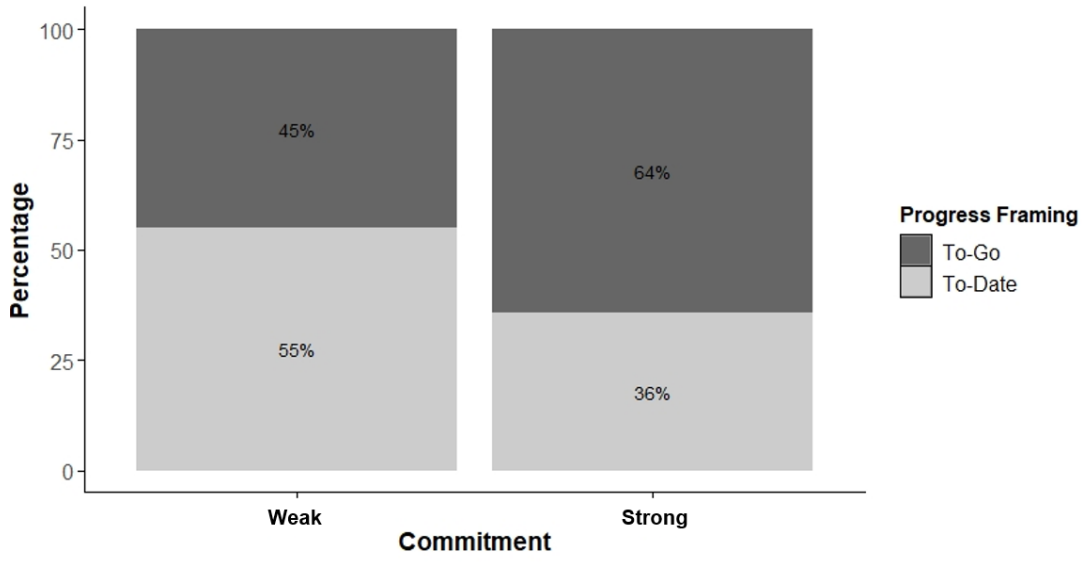
Table 3

Commitment and Progress Focus Predicting Progress Framing Choice in Study 1c

Predictor	*b*	*SE*	*z*	*p*	OR [95% CI]
Intercept	0.26	0.12	2.07	0.038	1.29 [1.01, 1.64
Commitment	0.48	0.04	12.75	<.001	1.62 [1.51, 1.75]
Progress Focus	-0.03	0.09	-0.36	.719	0.97 [0.81, 1.15]
Commitment x Progress Focus	0.06	0.04	1.61	.108	1.06 [0.99, 1.14]

Figure 5

Percentage of To-Date and To-Go Choices for Weak and Strong Commitment



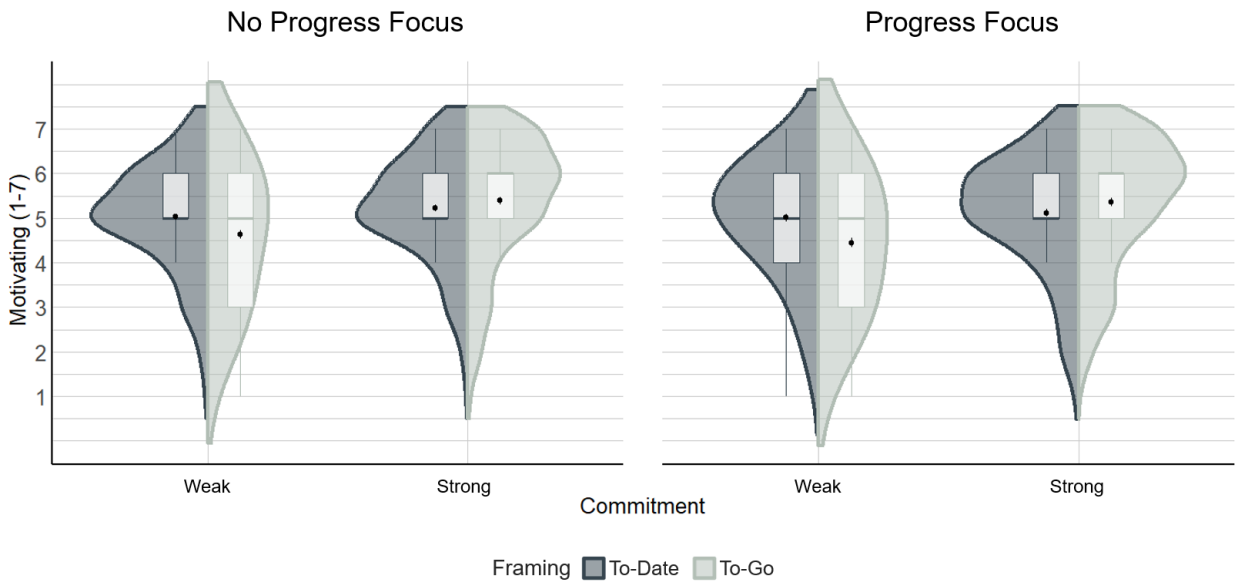
Beliefs Assessment: Continuous Ratings. I regressed the continuous motivation ratings on commitment (-1 = weak commitment, 1 = strong commitment), progress framing (-1 = to-date, 1 = to-go), progress focus condition (-1 = no focus on progress, 1 = focus on progress), and their interactions using a linear mixed-effects model (see Table 1). Consistent with Studies 1a and 1b, results revealed significant main effects of commitment and progress framing, which

were qualified by a significant commitment by progress framing interaction (see Table 1). The main effect of progress focus condition and its interactions with both commitment and progress framing were non-significant. However, the three-way interaction between commitment, progress framing, and progress focus condition was significant. See Table 2 for descriptive statistics and Figure 6 for results visualization.

To further explore this interaction, I conducted simple slopes analyses for both the no progress focus and progress focus conditions. Examining simple slopes as a function of commitment revealed that, for weak commitment scenarios, to-date was seen as more motivating than to-go in both the no progress focus condition, $b = -0.20$, $p < .001$, and in the progress focus condition, $b = -0.28$, $p < .001$. For strong commitment scenarios, to-go was seen as more motivating than to-date in both the no progress focus condition, $b = 0.08$, $p < .001$, and in the progress focus condition, $b = 0.12$, $p < .001$. Thus, although there was a significant three-way interaction, the patterns across the two conditions were consistent for the key comparison—that is, comparing to-date and to-go framing within a given commitment level. Notably, the effects were once again descriptively weaker under strong commitment than weak commitment.

Figure 6

Progress Framing Ratings as a Function of Commitment (Weak vs. Strong) and Progress Framing (To-Date vs. To-Go) for Progress Focus Conditions (No Progress Focus vs. Progress Focus)



Note. Graph represents split violin plots with density distributions of progress framing ratings for weak and strong commitment scenarios, with box plots, descriptive means (black dots) and 95% confidence intervals (black error bars).

Discussion

Studies 1a-1c provided preliminary evidence of the nature of people's metamotivational beliefs about to-date/to-go progress framing. Across all three studies, participants demonstrated normatively accurate beliefs on average, though there was substantial variability in these beliefs. Specifically, when asked to make a binary choice, participants believed that to-date framing was preferable to to-go framing under weak commitment, and vice versa for strong commitment, suggesting that people's beliefs align with normative effects typically found in the literature—

though the large percentage of people who deviated from these beliefs also indicates that there is notable variability in the normative accuracy of these beliefs. These patterns were similar whether participants were thinking about motivating themselves (Study 1a) or others (Study 1b), suggesting there were no notable differences in assessing beliefs for self or other when it came to choice, at least in the current context. Furthermore, this pattern of choice was consistent regardless of whether concerns with progress were made particularly salient or not (Study 1c).

Normative accuracy on average, and variability in this normative accuracy, was also apparent when examining participants' continuous ratings of these progress framing options. Across all three studies, participants recognized that for weak commitment scenarios, to-date framing would be more motivating than to-go framing. Participants also recognized that to-go framing would be more motivating than to-date framing for strong commitment scenarios, but this effect was only significant in two of the three studies (Study 1a and 1c), and the effect was consistently smaller than the effects for weak commitment scenarios. Thus, there was some evidence that strong commitment contexts might reduce participants' sensitivity to framing effects relative to weak commitment contexts. However, it is hard to know if this relatively weaker sensitivity to the differential benefits of to-date and to-go progress framing under strong commitment was partly attributable to the main effect of commitment, given that both framings were rated higher under strong versus weak commitment contexts. This may reflect a tendency for participants to overestimate the motivational value of both forms of progress framing in strong commitment scenarios, or perhaps an increased tolerance for less optimal framing in strong commitment contexts.

Regarding the secondary aim of Study 1, which was to explore and compare various assessment approaches, the pattern of results observed in Study 1b and 1c were fairly consistent

with the findings in Study 1a. Indeed, when it came down to making a choice—which theorizing from the judgement and decision-making literature suggests is often a stronger reflection of people's true preferences (Lichtenstein & Slovic, 1971; Tversky & Kahneman, 1981)—people's choices reflected an awareness of the differential effects of to-date and to-go progress framing regardless of which version of the assessment they completed. Minor differences between Study 1a and 1b were observed with the continuous ratings, but ultimately these did not meaningfully change the overall patterns of results. Given the consistency across these approaches, I used the Study 1a version as the scenario-based assessment of people's beliefs for the remainder of my dissertation research. In Study 2, I explored whether a similar pattern of beliefs would emerge in a new and more diverse sample. I also explored how the scenario-based beliefs assessment related to other personality and self-regulation constructs.

Study 2

Study 2 had two primary goals. First, Study 2 examined whether the patterns of metamotivational beliefs observed in a Canadian undergraduate sample would generalize to a United States-based community sample of older adults. To do this, in Study 2a I recruited a sample of MTurk workers (participants from an internet-based crowdsourcing data acquisition platform; Litman et al., 2017) from a larger panel study who participated in several waves of data collection from 2020 to 2022, completing a battery of personality, motivation, and other self-regulatory measures along with the beliefs assessment. Due to the exploratory nature of Study 2a, I conducted an additional preregistered replication of the beliefs assessment in this new demographic in Study 2b. Replicating these patterns in a different cultural and demographic context is an important step in establishing the robustness of the to-date/to-go progress framing beliefs assessment. In particular, this study assessed whether participants in this new sample would similarly demonstrate normatively accurate beliefs on average, along with individual variability in these beliefs, as observed in Study 1.

Second, because I had the opportunity in the Study 2a dataset to examine correlations with a large selection of additional measures, an additional aim of Study 2a was to evaluate the discriminant validity of the to-date/to-go beliefs assessment and explore its relationship more generally with 32 potentially relevant personality and self-regulation measures (e.g., promotion and prevention focus, self-control, conscientiousness, proactive personality). It is possible, for instance, that having more normatively accurate metamotivational beliefs in this domain is linked to other constructs that are strongly tied to motivation and self-regulation, such as self-control (Tangney et al., 2004), grit (Duckworth & Quinn, 2009), stronger promotion or prevention focus (Higgins et al., 2001), proactive personality (Seibert et al., 1999), or general

self-regulatory abilities (Fishbach et al., 2003). Given the nature of the beliefs assessment, one might also wonder whether individuals who exhibit normatively accurate beliefs about progress framing do so because they genuinely understand the motivational dynamics of to-date and to-go progress framing, or because they possess certain traits—such as higher conscientiousness or mindfulness—which might indirectly influence their responses. Examining these correlations helps to clarify whether the beliefs assessment is capturing something unique about this specific domain knowledge, rather than merely reflecting broader traits or tendencies. Additionally, this exploration provides valuable insights into potential relationships that might be important to account for in later studies. By investigating these relationships, the present study aimed to explore the relations between progress framing beliefs and these broader constructs.

Given the exploratory nature of the Study 2a analyses and the extended time frame over which the measures were assessed, strong or consistent correlations were not necessarily expected across all measures. Notably, previous research in other metamotivational domains, such as regulatory focus theory and construal level theory, have examined the relationships between normatively accurate beliefs and many of these variables, and have found that beliefs were not strongly correlated with these measures (Nguyen et al., 2022; Ross et al., 2023). Further, whether and how such knowledge gets translated into behaviour—and subsequently influences or connects with some of these other constructs—may depend on a number of factors.

In sum, by addressing both the generalizability of the beliefs assessment and its relationship with other potentially relevant personality and self-regulatory constructs, Study 2 contributes to a more nuanced understanding of normatively accurate progress framing beliefs and its place within the broader motivational landscape.

Method

Participants

Study 2a. The sample consisted of United States-based adults who were recruited from MTurk (hosted by CloudResearch) as part of a larger panel study.[5] After exclusions, there was a final sample size of N =186 (M_{age} = 42.93, SD_{age} = 12.75; 100 women, 100 men, 2 gender fluid; 79.2% White/European American, 5.8% Black/African American, 6.3% Asian American, 4.7% mixed racial/ethnic identity, 3.3% Hispanic/Latinx, 0.3% Native American; 0.3% did not report) who received payment for participating and consented to share their de-identified data. Based on the power analysis from Study 1a, this provided adequate power to detect an effect in the beliefs assessment analyses. For the correlational analyses, a sensitivity analysis revealed that the final sample size of 186 provided 95% power to detect an effect size as small as $\rho = .26$.

Study 2b. United States-based adults (N = 350) were recruited from MTurk. After exclusions, there was a final sample size of N = 340 (M_{age} = 43.62, SD_{age} = 12.02; 171 women, 154 men, 12 gender variant/non-conforming/other, 3 did not report; 5.3% East Asian, 74.1% White, 2.4% South Asian, 3.2% mixed racial/ethnic identity, 5.6% Black, 0.9% Middle Eastern, 7.6% Hispanic/Latinx). Because Study 2b was designed to be a preregistered replication of the previous beliefs assessment studies with a larger sample size in this new demographic, I doubled the previous Study 1 target from 150 to 300. To account for potential exclusions, I aimed to recruit 350 participants. The final sample size of 340 met the preregistered criteria. The preregistration is available at: https://osf.io/kzf8j/?view_only=e6420445473543ed9174efd6502e0f0e.

[5] This dataset has also been used in papers examining the relation between construal level metamotivational knowledge and performance (Nguyen et al., 2022) and regulatory focus metamotivational knowledge and performance (Ross et al., 2023).

Materials

To-Date/To-Go Metamotivational Beliefs Assessment. Participants completed the scenario-based metamotivational beliefs assessment from Study 1a.

Additional Measures. Participants in Study 2a completed several measures of self-regulation, emotion regulation, and personality to examine their relationships with metamotivational beliefs in June 2020, August 2020, October 2021, November 2022, and December 2022. The full list of measures can be found in Table 4.

Results

Metamotivational Beliefs (Studies 2a and 2b)

Applying the same analytic approach as Study 1a, results revealed that participants exhibited a similar pattern of beliefs as in Study 1. More specifically, examining participant's binary choices for Study 2a, results revealed that 61% of participants chose to-go for strong commitment scenarios, compared to 42% who chose to-go for weak commitment scenarios. This pattern was replicated in Study 2b: 57% of participants chose to-go for strong commitment scenarios, compared to 47% who chose to-go for weak commitment scenarios. This corresponds to significantly higher odds of choosing to-go for strong commitment versus weak commitment scenarios, Study 2a: OR = 1.87, $z = 13.25$, $p < .001$, 95% CI [1.70, 2.05]. Study 2b: OR = 1.39, $z = 9.77$, $p < .001$, 95% CI [1.30, 1.49].

Examining the continuous ratings, results revealed a significant commitment by framing interaction ($ps < .001$), with simple slopes analyses revealing that, for weak commitment scenarios, to-date was seen as more motivating than to-go in Study 2a, $b = -0.22$, $p < .001$, and Study 2b, $b = -0.13$, $p < .001$, whereas for strong commitment scenarios, to-go was seen as more motivating than to-date in Study 2a, $b = 0.08$, $p < .001$, and Study 2b, $b = 0.04$, $p = .018$. Thus,

the pattern of beliefs found in Study 1 appear to generalize to an older, community-based population in a different cultural context.

Metamotivational Beliefs Assessment and Self-Regulatory Measures (Study 2a)

To index the normative accuracy of metamotivational beliefs (henceforth also referred to as metamotivational knowledge) and explore whether individual differences in beliefs are correlated with other variables, I created an index of metamotivational using the continuous ratings from the scenario-based beliefs assessment. For each participant, ratings were averaged within each cell (weak/strong x to-date/to-go) before applying the following formula:

To-Date/To-Go Metamotivational Knowledge =

[weak commitment to-date ratings – weak commitment to-go ratings] +

[strong commitment to-go ratings – strong commitment to-date ratings]

This is modelled after procedures used in other metamotivational knowledge assessments (Hubley et al., 2024; Jansen et al., 2022; Nguyen et al., 2019; Scholer & Miele, 2016). Higher numbers on this index indicate that participants demonstrate greater normatively accurate metamotivational beliefs (i.e., *relatively* higher ratings for to-date framing under weak commitment goals and *relatively* higher ratings for to-go framing under strong commitment goals). Because each rating ranged from 1-7, the possible values on this index range from -12 to 12. In the present sample, scores ranged from -1.75 to 5.13 (M = 0.62, SD = 1.14). Note that this index is equivalent to the interaction score for each participant, thereby allowing me to capture the extent to which participants recognize the normative "if-then" contingencies of commitment and progress framings. As can be observed in this index, and consistent with the commitment x progress framing interaction, on average participants had normatively accurate knowledge (significantly greater than 0; M = 0.62, $t(185) = 7.36$, $p < .001$, d = 1.14).

Zero-order correlations revealed no significant associations between metamotivational knowledge and the personality and self-regulation measures.[6]

Table 4

Correlations Between Continuous Variables in Study 2a

Scale	*N*	Details: Example item (scale points)	Correlation with Metamotivational Knowledge
Self-Regulation Ability (Fishbach et al., 2003)	170	"To what extent are you successful at achieving your goals?" (1 = not at all successful, 7= extremely successful)	-.02
Self-Control (Tangney et al., 2004)	170	"I am good at resisting temptation." (1 = does not describe me, 5 = describes me extremely well)	.04
Promotion Focus (Higgins et al., 2001)	186	"I feel like I have made progress toward being successful in my life." (1 = certainly false, 5 = certainly true)	.05
Prevention Focus (Higgins et al., 2001)	186	"How often did you obey rules and regulations that were established by your parents?" (1 = never or seldom, 5 = always)	.002
Mastery Approach Motivation (Elliot & Murayama, 2008)	186	"My goal is to learn as much as possible." (1 = completely disagree, 5 = completely agree)	-.02
Mastery Avoidance Motivation (Elliot & Murayama, 2008)	186	"My aim is to avoid learning less than I possibly could." (1 = completely disagree, 5 = completely agree)	-.03
Performance Approach Motivation (Elliot & Murayama, 2008)	186	"My aim is to perform well relative to others." (1 = completely disagree, 5 = completely agree)	.04
Performance Avoidance Motivation (Elliot & Murayama, 2008)	186	"My aim is to avoid doing worse than others." (1 = completely disagree, 5 = completely agree)	.09
Behavioural Activation System (Carver & White, 2013)	186	"I go out of my way to get things I want." (1 = very true for me, 4 = very false for me)	.02
Behavioural Inhibition System (Carver & White, 2013)	186	"I feel worried when I think I have done poorly at something important." (1 = very true for me, 4 = very false for me)	.07
Behavioural Activation System (Corr & Cooper, 2015)	186	"I am often preoccupied with unpleasant thoughts." (1 = not at all, 4 = highly)	.04
Behavioural Inhibition System (Corr & Cooper, 2015)	186	"I'm motivated to be successful in my personal life." (1 = not at all, 4 = highly)	.09
Fight-Flight-Freeze System (Corr & Cooper, 2015)	186	"I am the sort of person who easily freezes-up when scared." (1 = not at all, 4 = highly)	-.004
Mindfulness (Brown & Ryan, 2003)	186	"I find it difficult to stay focused on what's happening in the present." (reverse-scored; 1 = almost always, 6 = almost never)	-.01
Conscientiousness (MacCann et al., 2009)	186	"I demand quality." (1 = not at all like me, 5 = very much like me)	-.03
Conscientiousness (Donnellan et al., 2006)	179	"I like order." (1 = very inaccurate, 5 = very accurate)	-.07
Openness (Donnellan et al., 2006)	179	"I am not interested in abstract ideas." (reverse-scored; 1 = very inaccurate, 5 = very accurate)	.09
Agreeableness (Donnellan et al., 2006)	179	"I sympathize with others' feelings." (1 = very inaccurate, 5 = very accurate)	.02
Extraversion (Donnellan et al., 2006)	179	"I am the life of the party." (1 = very inaccurate, 5 = very accurate)	-.02
Neuroticism (Donnellan et al., 2006)	179	"I have frequent mood swings." (1 = very inaccurate, 5 = very accurate)	.01
Proactive Personality (Seibert et al., 1999)	170	"I am constantly on the lookout for new ways to improve my life." (1 = strongly disagree, 7 = strongly agree)	-.08
Hope (Snyder et al., 1991)	170	"I can think of many ways to get out of a jam." (1 = definitely false, 4 = definitely true)	-.04

[6] It is also possible to examine "strong commitment knowledge" and "weak commitment knowledge" separately by isolating their subcomponents in the index formula; exploratory analyses revealed that there were a few significant correlations with these subcomponents (see Appendix D).

Grit - Perseverance (Duckworth & Quinn, 2009)	170	"I finish whatever I begin." (1 = does not describe me, 5 = describes me extremely well)	-.04
Grit - Consistency (Duckworth & Quinn, 2009)	170	"I often set a goal but later choose to pursue a different one." (reverse-scored; 1 = does not describe me, 5 = describes me extremely well)	-.09
John Henryism (James et al., 1983)	170	"I believe that hard work is the best possible way for a person to get ahead in life" (1 = does not describe me, 5 = describes me extremely well)	-.03
Spontaneous Self-Distancing (Ayduk & Kross, 2010)	170	Recall rejection experience (1 = mainly immersed participant, 7 = mainly distanced observer)	-.08
Emotion Reappraisal (Gross & John, 2003)	170	"I control my emotions by changing the way I think about the situation I'm in." (1 = strongly disagree, 7 = strongly agree)	.01
Emotion Suppression (Gross & John, 2003)	170	"I keep my emotions to myself." (1 = strongly disagree, 7 = strongly agree)	-.06
Positive Emotion Expression (Burton & Bonanno, 2016)	170	"A coworker gets a promotion and wants to talk about it." (1 = unable [to be even more expressive], 7 = very able [to be even more expressive])	.03
Negative Emotion Expression (Burton & Bonanno, 2016)	170	"You're attending the funeral of someone you don't know." (1 = unable [to be even more expressive], 7 = very able [to be even more expressive])	-.02
Positive Emotion Suppression (Burton & Bonanno, 2016)	170	"During a meeting with a supervisor, his/her phone unexpectedly begins to play an embarrassing ringtone." (1 = unable [to conceal], 7 = very able [to conceal])	.02
Negative Emotion Suppression (Burton & Bonanno, 2016)	170	"You are on a first date at a restaurant having dinner, and a stranger spills their drink on you." (1 = unable [to conceal], 7 = very able [to conceal])	.002

Note. All correlations were non-significant, *p*s > .05.

Discussion

Study 2 had two primary goals: to replicate the findings from Study 1 in a new and more diverse sample, and to evaluate the relationships between the scenario-based beliefs assessment and a wide range of personality and self-regulation constructs. The results from Studies 2a and 2b provided further evidence that participants, on average, hold normatively accurate beliefs about to-date and to-go progress framing, while also demonstrating significant variability in these beliefs. These findings were consistent with the patterns observed in Study 1, suggesting that the to-date/to-go progress framing beliefs assessment is robust across these two different cultural and demographic contexts. Specifically, participants in this United States-based community sample of older adults showed progress framing beliefs consistent with the Canadian undergraduate sample.

The Study 2a analyses exploring the relationships between metamotivational beliefs and 32 personality and self-regulation constructs revealed no significant correlations. These non-significant relationships have important implications for understanding the nature of progress

framing beliefs. On the one hand, the absence of significant correlations supports the idea that these beliefs represent a unique construct that is distinct from broader traits and self-regulatory capacities like conscientiousness, grit, or self-control. This aligns with prior findings in other metamotivational domains, such as regulatory focus and construal level theory, where normatively accurate beliefs were similarly found to be largely unrelated to these broader personality and motivation measures (Nguyen et al., 2022; Ross et al., 2023). On the other hand, it is worth considering why constructs that are strongly tied to motivation regulation did not correlate with metamotivational knowledge, as metamotivational knowledge might theoretically be linked to broader self-regulatory capacities. Partly this likely reflects a key distinction between metamotivational knowledge and other factors that often contribute to goal pursuit and self-regulatory success. Whereas these other factors often reflect presumed general capacities (e.g., trait self-control), metamotivational beliefs about to-date and to-go framing are simply one type of knowledge that might help individuals navigate certain situations more effectively; knowledge is not domain general nor even necessarily relevant in every situation. It is possible that correlations with these other constructs would only be observed if one could extract a kind of general metamotivational knowledge that reflects normative accuracy across a number of key domains. Another possibility is that relations between metamotivational knowledge and some of these constructs may not be direct, but indirect. For instance, metamotivational knowledge coupled with high executive function predicting resilience, or knowledge and strong commitment to a goal predicting self-control capacities in some situations.

One potential limitation of Study 2a is that the measures were collected as part of a larger panel study, with assessments spaced across multiple time points (from June 2020 to December 2022). Given this, it is possible that the strength of relationships between constructs was

attenuated due to the time gaps between measures. However, research suggests that although there can be some small changes throughout the lifespan, personality traits and other individual differences are relatively stable over time (e.g., Bleidorn et al., 2012; McCrae & Costa, 1994), as are other constructs similar to metamotivational beliefs that are characterized by both stability and lability (e.g., the Personalized Psychological Flexibility Index, or PPFI; Kashdan et al., 2020). Given that the feasibility of assessing a such a large array of self-regulation and personality measures in a short timeframe is quite low due to the high demand on participants, I felt it was worthwhile to take advantage of the opportunity to explore these relationships in this dataset.

Despite the null correlations, Study 2 provides valuable contributions to the assessment and understanding of progress framing beliefs. By replicating the results of Study 1 in a different sample, this study demonstrated that normatively accurate beliefs about to-date and to-go progress framing are consistent across these two cultural and demographic contexts. Additionally, the non-significant correlations with broader personality and self-regulation measures offer some evidence that these beliefs represent a distinct construct within the broader motivation literature.

Studies 1 and 2 demonstrated that, on average, people's progress framing beliefs aligned with the normative effects in the literature, though there was also substantial variability in these beliefs. Notably, this work assessed people's beliefs using hypothetical goal scenarios. Although this approach is consistent with other metamotivational assessments, it is not without its limitations, as it does not fully capture how peoples' beliefs might manifest in the context of their real goals. Further, assessing beliefs in this manner—by explicitly labelling commitment as strong or weak—makes the signal inherently unambiguous. But in the messy reality of goal

pursuit, this often is not the case; one first has to be able to detect that signal (i.e., one's commitment), and then act on it. Consequently, it is unclear whether these metamotivational beliefs will extend beyond hypothetical scenarios to real-world contexts when people are making consequential choices regarding their own goals. I explored this in Study 3.

Study 3

Studies 1 and 2 examined people's beliefs about to-date and to-go progress framing as a function of goal commitment using a scenario-based beliefs assessment. These studies demonstrated that, on average, people's beliefs aligned with the normative effects in the literature. However, it is unclear whether a similar pattern of beliefs would persist if the commitment signal were not so explicitly clear, such as when people are making a more consequential choice for tracking progress on their own goals. Study 3 addresses this by examining people's progress framing choices for their current, personal goals.

Exploring beliefs in this context offers valuable insights, regardless of whether participants demonstrate normatively accurate beliefs. If progress framing choices do align with the normative effects in the literature, this would suggest that people have a relatively sophisticated metamotivational awareness wherein they are able to infer and act on an internal signal of commitment. Conversely, if participants' beliefs diverge from the patterns observed in the earlier studies, this could indicate that there is a gap between what people understand about effective progress framing and what is happening in practice. Thus, unlike hypothetical scenarios containing salient and unambiguous information about commitment, assessing beliefs via people's consequential choices for their real-life goals may begin to provide a more nuanced understanding of when and in which contexts individuals might effectively engage with progress framing strategies in their lives.

To that end, participants in Study 3 identified six current personal goals and were randomly assigned to focus on one of them. They rated their commitment to that goal and were asked to choose either a to-date or to-go progress tracking worksheet to monitor their progress on their goal, with the expectation that they could be asked to participate in a follow-up study.

Participants also provided ratings of how motivating and helpful each worksheet would be for their goal. Finally, they also completed a measure of dispositional optimism across all four studies; analyses with this measure are reported in Appendix F.

I collected two initial exploratory samples (Studies 3a and 3b), followed by two additional samples with preregistered analysis plans (Studies 3c and 3d; See Appendix A).[7] To maximize power (Cooper & Patall, 2009; Curran & Hussong, 2009), I also analyzed the data across all four studies as an exploratory mega-analysis ($N = 746$), per recommendations to evaluate evidence across all available data (Fabrigar & Wegener, 2016; Goh et al., 2016).

Given that Study 3 was an initial exploration into people's beliefs when commitment is no longer an unambiguous signal, I did not have strong predictions about whether participants' choices would reflect normatively accurate beliefs in this context. However, if they did, normatively accurate metamotivational beliefs of worksheet choice would reflect the progress framing by commitment interaction found in previous research. Specifically, if participants make normatively accurate choices, participants who are more strongly committed to their goal should choose the worksheet that emphasizes a to-go frame, whereas participants who are less committed should choose the worksheet that emphasizes a to-date frame. Participants who are more strongly committed should also rate the to-go worksheet as more motivating than the to-date worksheet, and vice versa for those who are less committed. However, given the pattern of beliefs in the previous studies, I thought it was possible that participants might demonstrate reduced sensitivity to the differential benefits of to-date and to-go progress framing when

[7] Studies 3a and 3b, which were conducted simultaneously, had slight methodological variations from Studies 3c and 3d, including a manipulation of commitment in Study 3a, and the metamotivational beliefs assessment in Studies 3a and 3b; see Appendix E for the metamotivational beliefs analyses as well as Appendix F for exploratory analyses examining the relationship between metamotivational knowledge and worksheet choice. The commitment manipulation in Study 3a was not successful and did not relate to choice. I report detailed analyses and discuss potential implications in Appendix F.

commitment is strong, such that they view both framings as relatively similar in effectiveness for sustaining their motivation.

Method

Participants

Study 3a. Undergraduate participants (N = 265) completed an online study in exchange for course credit. The study took place from January-April, 2021. After exclusions (n = 24), Study 3a had a final sample size of N = 241 (M_{age} = 20.05, SD_{age} = 2.23; 160 women/transwomen, 75 men/transmen, 4 gender non-binary/fluid, 2 did not report; 39.8% White, 23.2% South Asian, 19.5% East Asian, 5.4% mixed racial/ethnic identity, 6.6% Middle Eastern, 2.9% Black, 1.2% Hispanic/Latinx, 0.4% did not report). A sensitivity analysis revealed that I had 99% power to detect an effect size as small as ρ = .27.

Study 3b. Undergraduate participants (N = 164) completed an online study in exchange for course credit. The study took place from January-April, 2021. After exclusions (n = 13), Study 3b had a final sample size of N = 151 (M_{age} = 20.34, SD_{age} = 3.18; 98 women/transwomen, 48 men/transmen, 4 gender non-binary/fluid; 1 did not report; 40.4% White, 21.9% East Asian, 23.2% South Asian, 4.6% mixed racial/ethnic identity, 1.3% Black, 5.3% Middle Eastern, 2% Aboriginal/First Nations, 1.3% Hispanic/Latinx). A sensitivity analysis revealed that I had 99% power to detect an effect size as small as ρ = .33.

Study 3c. Undergraduate participants (N = 196) completed an online study in exchange for course credit. The study took place across two different semesters: Spring, 2021 (May-August, n = 109) and Fall, 2021 (September-December, n = 87). After exclusions (n = 21), Study 3c had a final sample size of N = 175 (M_{age} = 20.75, SD_{age} = 3.38; 137 women/transwomen, 37 men/transmen, 1 gender non-binary/fluid; 30.3% White, 30.3% East Asian, 18.9% South Asian,

10.9% mixed racial/ethnic identity, 4.0% Black, 5.7% Middle Eastern). A sensitivity analysis revealed that I had 99% power to detect an effect size as small as ρ = .31.

Study 3d. Undergraduate participants (N = 202) completed an online study in exchange for course credit. The study took place January-April, 2022. After exclusions (n = 23), Study 3d had a final sample size of N = 179 (M_{age} = 19.98, SD_{age} = 3.24; 125 women/transwomen, 48 men/transmen, 3 gender non-binary/fluid, 3 did not report; 34.6% White, 29.6% South Asian, 18.4% East Asian, 5% mixed racial/ethnic identity, 5% Middle Eastern, 3.9% Black, 1.7% Hispanic/Latinx, 0.6% did not report). A sensitivity analysis revealed that I had 99% power to detect an effect size as small as ρ = .31.

Procedure and Materials

Participants were asked to generate a list of six of their own short-term, real-world goals. They were then randomly assigned a focal goal from the list that they provided and told to focus on that goal for the rest of the study. Participants then completed a measure of goal commitment for the selected goal and the consequential choice task (order was counterbalanced). For the consequential choice, participants were asked to choose one of two progress tracking worksheets (emphasizing either a to-date or to-go frame), with the expectation that they could be asked to report on their experience using the chosen worksheet in a follow-up study. Participants were then asked to describe their reasons for their choice and provided ratings of how motivating they thought each worksheet would be for their focal goal. Participants also indicated their current level of progress on their focal goal. The complete text for the worksheets, along with additional measures unrelated to the current research question, are available in Appendices F and B.

Goal Generation. In the goal generation phase of the study, participants were told "List 6 short-term goals, in no particular order, that you are currently working towards. These should be

goals that have a specific endpoint, and that you have taken some steps to complete, but haven't fully completed yet." To ensure that participants' goals met these criteria, the following examples were provided: "save $100 to purchase a new desk chair", "exercise 4 times every week this month", and "find 10 resources to reference in an end of term assignment". Participants reported how much existing progress had been made on their goal. The mean reported goal progress was 40.12% (*SD* = 26.31) complete, suggesting that, on average, participants were around the middle of goal pursuit.

Goal Commitment. Participant's level of commitment to their focal goal was assessed using Klein et al.'s (2014) Unidirectional, Target-free (KUT) measure of commitment, with the items phrased to specify the focal goal as the target. This scale has been previously validated and is widely used. Sample items include "To what extent do you care about this goal?" and "To what extent have you chosen to be committed to this goal?" Participants responded to these items on a scale from 1 (*not at all*) to 7 (c*ompletely*). This measure showed good reliability, α = .93. This step in the procedure was counterbalanced with the progress framing choice.

Consequential Choice: Progress Framing Worksheet. To assess participants' metamotivational beliefs of the relationship between goal commitment and goal progress framing, participants were asked to make a choice between to-date and to-go framing for tracking progress on their focal goal. Participants were asked to select one of two progress tracking worksheets, with the expectation that they could be asked to participate in a follow-up study to report on their experience of using the worksheet that they chose. This part of the study used deception, as the follow-up study was not actually being conducted, but participants were told that this was the case in order to make them feel that their worksheet choice was consequential. One worksheet emphasized progress in a to-date frame, and the other worksheet

emphasized progress in a to-go frame; participants viewed a sample of each worksheet before making their choice.[8] Participants were instructed to choose the worksheet that they thought would be most helpful for motivating them to continue working towards their focal goal. This step in the procedure was counterbalanced with the goal commitment measure.

Continuous Ratings of Progress Framing Worksheets. To examine participants' perceptions of how motivating to-date and to-go progress framing would be at their level of commitment, participants responded to 4 items (per worksheet) regarding how motivating and helpful the worksheet would be for their goal. Specifically, participants rated how motivating they thought each worksheet would be on a scale from 1 (*extremely demotivating*) to 7 (*extremely motivating*), and how helpful they thought each worksheet would be for helping them stay focused on their goal, make progress, and achieve goal success using a scale from 1 (*extremely unhelpful*) to 7 (*extremely helpful*). This composite showed good reliability: to-date worksheet $\alpha = .87$; to-go worksheet $\alpha = .88$.

Results

Consequential Choice

To assess whether participants' choices demonstrated normatively accurate metamotivational beliefs of to-date vs. to-go progress framing, I conducted point-biserial correlations between goal commitment and worksheet choice (to-go worksheet coded as 1). Table 5 includes the zero-order correlations for Studies 3a-3d, as well as the combined sample. Consistent with normatively accurate metamotivational beliefs, commitment was positively

[8] Although the worksheets were described at the same time (i.e., no page breaks), one naturally had to be mentioned first. In Studies 3a and 3b, the to-date worksheet was displayed before the to-go worksheet (i.e., either above or to the left, depending on participant's screen layout). In Studies 3c and 3d, the order was counterbalanced; exploratory analyses suggest that order did not moderate the relationship between commitment and worksheet choice/ratings. Exploratory analyses also examined potential progress framing order effects for Studies 4 and 5; results revealed that order did not significantly moderate the results in those studies and therefore is not discussed further.

correlated with choosing the to-go worksheet across samples with the exception of Study 3c (see Table 5).[9]

Table 5

Correlations Between Goal Commitment and Worksheet Choice/Ratings in Study 3

	N	Choice (1 = To-Go Worksheet)	To-Date Worksheet	To-Go Worksheet
Study 3a	241	***r* = .13, *p* = .053**	*r* = .07, *p* = .311	***r* = .20, *p* = .001**
Study 3b	151	***r* = .19, *p* = .017**	*r* = -.07, *p* = .395	***r* = .28, *p* < .001**
Study 3c	175	*r* = .04, *p* = .571	*r* = .101, *p* = .185	*r* = .03, *p* = .676
Study 3d	179	***r* = .17, *p* = .027**	***r* = .19, *p* = .012**	*r* = .09, *p* = .217
Combined	746	***r* = .13, *p* < .001**	***r* = .08, *p* = .040**	***r* = .15, *p* < .001**

Worksheet Continuous Ratings

To examine whether participants' goal commitment was related to their perceptions of how motivating each worksheet would be for pursuing their goal, bivariate correlations were conducted between commitment and the composites of the continuous ratings of each worksheet (Table 5; see Table 6 for descriptives). For the to-go worksheet, consistent with the consequential choice data, there was a significant positive correlation between commitment and to-go ratings in the combined sample. This effect was less consistent across samples compared to the worksheet choice results, emerging in only two of the four samples. For the to-date worksheet, there was also an unexpected significant positive correlation between commitment and to-date ratings in

[9] Additional exploratory analyses were conducted for Study 3c; see Appendix F for these results and a discussion of how the timing of the Study 3c data collection in relation to the COVID-19 pandemic may have influenced the results.

the combined sample, reflecting normatively inaccurate beliefs. This effect was less consistent across samples, emerging only in Study 3d.

Table 6

Descriptive Statistics for Study 3

		M (*SD*)		
	N	Commitment	To-Date Worksheet	To-Go Worksheet
Study 3a	241	5.31 (1.06)	5.13 (1.18)	5.15 (1.21)
Study 3b	151	5.32 (1.17)	4.97 (1.19)	5.13 (1.23)
Study 3c	175	5.61 (1.08)	5.14 (1.26)	5.09 (1.17)
Study 3d	179	5.45 (1.14)	5.22 (1.09)	5.17 (1.20)
Combined	746	5.42 (1.11)	5.12 (1.18)	5.14 (1.20)

Discussion

Study 3 explored people's metamotivational beliefs in the context of individuals making consequential choices for their personal goals. Results revealed evidence of normatively accurate beliefs in this real-world context, such that when goal commitment was stronger, participants were more likely to choose the to-go worksheet and rate it as more motivating. These patterns of results were fairly robust, emerging in the combined sample and fairly consistently across the four individual samples (3/4 samples for choice, though only 2/4 samples for the continuous ratings; see Appendix F for additional details about Study 3c and potential insights into why the sample may have deviated from the other samples).

There was also some evidence reflecting normatively inaccurate beliefs such that participants also rated the to-date worksheet as more motivating when their commitment was stronger. Notably, the correlation was relatively smaller, and the pattern was less consistent at the

sample-level, emerging in only one of the four samples. Nonetheless, this suggests that similar to Studies 1 and 2, there is significant variability in the accuracy of people's beliefs; people may not always be able to fully distinguish the benefits of these ways of framing progress. That is, similar to the main effect of commitment found using the scenario-based assessment, it appears that when commitment is *strong*, people may be less likely to recognize and leverage the distinct benefits of to-date and to-go progress framing—an issue I expand in the general discussion. However, it is worth noting that participants' reported commitment levels were relatively high on average (M = 5.31, SD = 1.06, on a 1-7 scale), potentially creating ceiling effects that could have limited the ability to detect potential differences in framing preferences.

Although the present study found evidence that goal commitment was related to progress framing decisions, the effect sizes were fairly small. I can speculate on some possible factors that may have contributed to this. It is important to note that the design did not strictly limit participants to nominate goals that were only at the approximate midpoint of progress. Participants were instructed to nominate goals "… that you have taken some steps to complete, but haven't fully completed yet". Still, the mean reported goal progress was 40.12% (SD = 26.31), which suggests that, on average, participants were around the middle of goal pursuit, but that there was also substantial variability. As I have alluded to, it is possible that a strategic focus on progress to-date vs. progress to-go using commitment as a signal may be particularly relevant when people are in the middle of goal pursuit (compared to when people further away from the midpoint, which can come with additional, competing signals—an issue I expand on in the general discussion; Bonezzi et al., 2011). In addition to better controlling for goal progress, future research should also consider other variables that might influence the relationship between commitment and progress framing preferences, including and controlling for factors such as goal

duration, urgency, and specificity (Baek & Yoon, 2020; Wallace & Etkin, 2018), or self-efficacy and outcome expectancies (Bandura, 1986; Eccles et al., 1983).

In sum, Study 3 demonstrated a relationship between goal commitment and progress framing choices in the context of people's personal goals, reflecting a pattern of normatively accurate beliefs that was fairly consistent with those observed using the scenario-based assessment, with some hints that people may be less sensitive under strong commitment. Notably, unlike Studies 1 and 2 which made commitment a salient and unambiguous cue by explicitly labelling the level of commitment, the relationship between commitment and choice observed in Study 3 offers preliminary evidence that people may indeed recognize and use their internal commitment signals to guide their progress framing decisions—at least in the context of personal goals that tend to be more meaningful and higher stakes.

What remains unclear is the nature of this signal to which people are attending. That is to say, Study 3 explored people's metamotivational beliefs via their progress framing choices for their real-life goals and demonstrated that people do seem to have some awareness of the differential effects of to-date and to-go framing as a function of commitment in a context where the signal is relatively ambiguous. However, many questions persist regarding people's metamotivational beliefs and how commitment functions as a guiding signal for people's progress framing decisions. For instance, what is it about that signal that people might be attending to? And will it always be used as a cue for guiding progress framing decisions, or are there certain contexts in which it becomes less accessible or relevant? To begin to address these questions, Study 4 employs a paradigm that experimentally manipulates commitment[10] to an

[10] While Study 3a was originally designed to manipulate participants' commitment to their personal goals, this manipulation was unsuccessful (see Appendix F), suggesting the need for future work to develop and test new manipulations.

online laboratory task and examines whether experimentally induced differences in commitment influence progress framing choices. Testing whether the correlational effects observed in the present study can be manipulated and captured in a more controlled setting, Study 4 offers an opportunity to deepen our understanding of people's metamotivational beliefs and the extent to which people effectively engage with progress framing strategies in goal pursuit.

Study 4

Studies 1-3 assessed people's metamotivational beliefs in the context of both hypothetical scenarios and real-world goals. These studies demonstrated that, on average, people have normatively accurate beliefs about to-date and to-go progress framing, though there is also notable variability in these beliefs. Study 3 in particular found that people made differential progress framing choices as a function of their *own* level of commitment for their personal goals. Building on this, Study 4 was designed to examine whether people would make similar differential choices when their commitment was manipulated directly in a more controlled setting. While Study 3 provided some initial evidence that people can detect and accurately respond to their internal commitment signals for their goals, it also raised important questions about the nature of this signal and whether it will consistently guide people's progress framing decisions. By employing a new experimental paradigm, Study 4 offers an opportunity to further explore these questions and deepen our understanding of how and when people's choices will reflect normatively accurate metamotivational beliefs.

To that end, Study 4 experimentally manipulated participants' commitment to an online anagram task and had them choose how to track their progress throughout the task. Participants were randomly assigned to either a strong commitment condition or a weak commitment condition, manipulating whether they would be relatively more or less committed to the anagram task. The manipulation[11] involved three stacked components to increase goal commitment: 1) a bogus *Psychology Today* article discussing the cognitive benefits of engaging in "brain stimulating" activities like anagram tasks, 2) an explicit commitment statement prompt, and 3) a

[11] An iterative piloting process was used to develop the commitment manipulation, which involved variations in the information provided in the fake article, the statements that participants were asked to type out regarding their commitment to the task, and whether there was a monetary prize.

bogus random assignment for inclusion in a gift-card draw. Following the manipulation, participants were asked to choose the progress tracking option that would help them stay engaged and perform their best, with the expectation that whatever option they chose would be used during the task. Participants also completed provided ratings of how motivating and helpful each progress tracking option would be for the task.

Given the patterns of results observed with the binary choice data from the previous studies, I predicted that participants' choices would reflect normatively accurate beliefs such that those in the weak commitment condition would be more likely to choose to focus on their existing progress and those in the strong commitment condition would be more likely to choose to focus on their remaining progress. I did not have strong a priori predictions regarding the continuous ratings of the progress framing options, but based on what was observed in the existing studies, it was reasonable to expect that participants ratings might also reflect normatively accurate metamotivational beliefs. However, it was also possible that those in the strong commitment condition might demonstrate reduced sensitivity to the differential benefits of to-date and to-go progress framing, such that they would view both framings as relatively similar in effectiveness for sustaining their motivation.

Method

Participants

United States-based adults ($N = 204$) were recruited from MTurk (hosted by CloudResearch) in exchange for $5 USD. After exclusions, there was a final sample size of N =188 ($M_{age} = 40.45$, $SD_{age} = 11.57$; 86 women/transwomen, 91 men/transmen, 3 gender non-binary/fluid, 8 did not report; 71.3% White, 1.6% South Asian, 5.3% East Asian, 2.1% mixed racial/ethnic identity, 0.5% Middle Eastern, 11.2% Black, 7.4% Hispanic/Latinx). For the

iterative piloting process used to develop of commitment manipulation, I recruited sample sizes of 100. For the present study, I doubled that estimate and aimed to recruit 200 participants. Sensitivity power analyses revealed that my final sample size of 188 participants provided 95% power to detect an effect size as small as $w = .26$ for the chi-square analysis, $\rho = .26$ for the bivariate correlations, and $f = .16$ for a repeated measures ANOVA with 2 groups and 2 repeated measures.

Procedure and Materials

The study was advertised as examining beliefs about motivation and goals. Participants were introduced to the anagram task, which involved unscrambling letters to make words. They were told that the anagrams ranged in difficulty, and performance would be measured based on a combination of the difficulty of the anagram and how quickly they were solved. The task was framed as a way to explore how people stay motivated while completing challenging activities. Participants then underwent the commitment manipulation, after which they were asked to choose how they wanted to track their progress during the task, with the options emphasizing either progress to-date or progress to-go (counterbalanced). After the choice was made, participants' commitment to the task was measured as a manipulation check. Participants also rated how motivating each progress tracking option would be for the task and were given an open-ended question asking about their progress tracking choice. Finally, participants answered additional questions pertaining to their understanding of the article and their beliefs about anagram tasks. Participants were then told that they would not actually be completing an anagram task for the study. They were also told that all participants were eligible for the gift card draw and were given the opportunity to enter by providing an e-mail address. Participants also

completed the beliefs assessment from Study 1a (order was counterbalanced with the anagram task).

Manipulation Component 1: Bogus "*Psychology Today*" Article. Participants were randomly assigned to either a strong (n = 92) or weak (n = 96) commitment condition (see Table 7 for an overview of the full manipulation procedure). For the first part of the stacked manipulation, participants were told that "because brain-stimulating activities like anagrams have been receiving a lot of media attention regarding potential cognitive benefits", they would first be reading an excerpt from a recent *Psychology Today* article discussing the evidence (or lack thereof) for these claims. The bogus article, "Do brain teasers really improve cognitive functioning", was designed to look like an article from the *Psychology Today* website by modifying a screen-capture of a real article from the website (see Appendix G for study materials). In both conditions, the article begins by referencing claims of cognitive benefits often associated with these popular "brain teaser" apps or games (e.g., Lumosity, Wordle) and then discusses a recent (fictitious) meta-analysis conducted by a neuropsychologist and his research lab. For the strong commitment condition, the article suggested that the evidence for cognitive benefits was very strong, with even just a few minutes of engaging in these activities leading to improvements in cognitive ability and brain functioning. Conversely, in the weak commitment condition, the article suggested that the results of the meta-analysis offered no evidence of cognitive benefits from these types of activities. The study was programmed such that the button to advance to the next page was delayed for 20 seconds in an effort to encourage participants to read the article. The key takeaways (i.e., whether or not there is evidence of cognitive benefits) were also bolded and underlined in the article, and a brief summary of the article weas presented on the following page, to further emphasize and reiterate the key message from the article.

Table 7

Anagram Commitment Manipulation Materials in Study 4

	Commitment Manipulation Condition	
Procedure	Strong Commitment (n = 92)	Weak Commitment (n = 96)
Anagram Task Introduction	For this next task, you will be unscrambling letters to make words. This is referred to as an anagram task. These anagrams range in difficulty, and performance is measured based on a combination of the difficulty of the anagram and how quickly they are solved. Some of these sets of letters may have many possible solutions, some may have only one solution, and some may be unsolvable. **We are interested in how people stay motivated during this task.**	
	Manipulation Component 1: Bogus *Psychology Today* Article	
Article Description	Before you begin this task, we want to tell you a bit more about anagrams and other "brain-stimulating" tasks like this, because they have been getting a lot of attention from the media lately. We have provided an excerpt from a recent Psychology Today article, discussing …	
	the potential cognitive benefits of engaging in these types of activities.	the lack of evidence for the claim that these types of activities provide any cognitive benefits.
Article	See Appendix G	
Article Summary	To summarize, research suggests that engaging in these types of activities **can be beneficial** for improving cognitive functioning – even if it's only for a few minutes a day! And you will have the opportunity to experience this yourself by completing the anagram task in this study.	To summarize, the research suggests that there is currently **no evidence** for a link between engaging in these types of activities and improvement in cognitive functioning. Thus, we cannot say that completing the following anagram task will provide you with any additional cognitive benefits.
	Manipulation Component 2: Explicit Commitment Statement	
Explicit Statement Description	Before you begin, research suggests that it is beneficial when pursuing a goal to publicly commit to the goal. Consequently, for this experiment, we would like you to type the following statement in the box below:	
Explicit Statement Prompt	"I am committed to completing the anagram task and recognize that engaging in this task in this study can provide me with cognitive benefits."	"I am committed to completing the anagram task, although I recognize that working on this task does not improve my cognitive functioning."
	Manipulation Component 3: Bogus Gift Card Random Assignment	
Gift Card Bonus Description	In some conditions, people are going to be randomly assigned for a chance to receive a monetary bonus on the basis of their participation in the anagram task – in the form of an entry into a draw for a $50 CAD Amazon gift card! Please click next to be randomly assigned to one of the two bonus gift card conditions.	
Gift Card Bonus "Results"	You've been randomly assigned to the condition with a chance for a monetary bonus! After completing the anagram task, you will be entered into a draw for the chance to win a $50 CAD Amazon gift card!	Unfortunately, you've been randomly assigned to the condition with **no** additional financial bonus. Participating in the anagram task will **not** enter you into the bonus gift card draw.

Manipulation Component 2: Explicit Commitment Statement. To further manipulate participants' commitment to the goal, participants completed an explicit commitment statement. Research has shown that explicit statements are effective at increasing personal commitment and belief in the stated content, especially when these statements are made publicly or in writing (Higgins & Rholes, 1978; Janis & King, 1954; Kiesler, 1971). Participants were told that research suggests it is beneficial for goal pursuit to publicly commit to a goal, and were asked to type the following statement in the open-ended text box provided. For the strong commitment condition, the statement was "I am committed to completing the anagram task and recognize that engaging in this task in this study can provide me with cognitive benefits", whereas the statement for the weak commitment condition was "I am committed to completing the anagram task, although I recognize that working on this task does not improve my cognitive functioning."

Manipulation Component 3: Bogus Random Assignment for Gift Card Draw. For the final component of the stacked manipulation, participants were told that people in the study were going to be randomly assigned for a chance to be entered in a draw for a monetary bonus (i.e., an Amazon gift card), which would be based on their participation in the anagram task. After clicking the proceed button to be "randomly assigned" to one of the two bonus gift card conditions (i.e., included in the draw vs. not included in the draw), participants in the strong commitment condition were told that they were randomly assigned to the condition that includes a gift card draw, whereas participants in the weak commitment condition were told that they were randomly assigned to the condition with no draw for an additional financial bonus.

Progress Tracking Choice and Ratings. Participants were told that "we can track our progress in different ways to motivate ourselves" and that they would get to choose how they would like to monitor their progress to help them perform better. Participants were then

presented with descriptions and visual examples of the two tracking options (see Appendix G), which depicted either looking back at the starting line and thinking about how far they had come (to-date progress) or looking towards the finish line and thinking about how much they have left to go (to-go progress; order was counterbalanced). Participants were then asked to "choose how you would like to monitor your progress during the anagram task to help you stay engaged and perform your best?", with the options of A) focus on the starting line, or B) focus on the finish line. On a subsequent page, participants also rated how motivating each of the two progress tracker options would be, on a scale from 1 (*not at all motivating*) to 7 (*extremely motivating*). Finally, participants also answered an open-ended question asking why they chose Option A[B] instead of Option B[A].[12]

Goal Commitment. Participant's level of commitment to the anagram task was assessed using two items from Klein et al.'s (2014) commitment measure, with the items phrased to reference commitment to the anagram task. Specifically, participants were asked "Thinking about the anagram task …" 1) "How committed are you to this task?" and 2) "To what extent do you care about this task?", on a scale from 1 (*not at all*) to 7 (*extremely*). This measure showed good reliability, $\alpha = .95$.

Anagram Article Comprehension and Beliefs. Additional questions pertaining to participants' comprehension of the Psychology Today article and their beliefs about the benefits of the anagram task were included for exploratory purposes.[13] Specifically, participants were

[12] This question was included for exploratory purposes and has not been systematically analyzed.

[13] These questions were not included a priori as exclusion criteria. However, exploratory analyses revealed that excluding individuals who answered the article comprehension question incorrectly ($n = 10$, all in the weak commitment condition) or controlling for beliefs about the benefits of the task did not change the pattern of results. Furthermore, regarding perceptions of benefits of the anagram task, those in the strong commitment condition ($M = 4.83$, $SD = 1.80$) rated it as more beneficial than those in weak commitment condition ($M = 3.34$, $SD = 2.04$), $t(186) = 5.28$, $p < .001$, $d = 1.92$, consistent with the information provided in their respective articles.

asked which of two statements best aligned with the article they read: "Scientists concluded that engaging in an anagram task … 1) is BENEFICIAL for improving cognitive abilities *or* 2) is NOT BENEFICIAL for cognitive abilities". They were also asked "How beneficial do you think engaging in this task will be?" on a scale from 1 (*not at all*) to 7 (*extremely*).

To-Date/To-Go Metamotivational Beliefs Assessment. Participants completed the scenario-based metamotivational beliefs assessment from Study 1a. Participants demonstrated a pattern of metamotivational beliefs consistent with the earlier studies; see Appendix E for details.

Results

Descriptive statistics and zero-order correlations can be found in Table 8. There was no significant correlation between commitment and progress framing choice. There were significant positive correlations between commitment and both types of progress framing. I elaborate on these findings in the study discussion section.

Table 8

Descriptive Statistics and Correlations in Study 4

	M (*SD*)	1	2	3
1. Commitment	5.19 (1.71)	-		
2. To-Date Ratings	4.66 (1.76)	.40***	-	
3. To-Go Ratings	4.97 (1.74)	.24***	-.29***	-
4. Progress Framing Choice (1 = to-go)	N/A	-.05	-.54***	.56***

* $p < .05$, ** $p < .01$, *** $p < .001$; $N = 188$

Commitment Manipulation

An independent-samples t-test revealed that those in the strong commitment condition ($M = 5.60$, $SD = 1.58$) reported significantly higher levels of commitment than those in the weak commitment condition ($M = 4.80$, $SD = 1.74$), $t(186) = 3.30$, $p = .001$, $d = 1.67$, suggesting that

the commitment manipulation was successful. Notably, the means were significantly above the midpoint for both the strong commitment, $t(91) = 12.75$, $p < .001$, $d = 1.58$, and weak commitment conditions, $t(95) = 7.32$, $p < .001$, $d = 1.74$.

Progress Framing Choice

A chi-square test of independence revealed that progress framing choice did not differ as a function of commitment condition, $X^2(1, N = 188) = 0.31$, $p = .312$ (see Table 9 for progress choice frequencies).

Table 9

Frequencies of Progress Framing Choices for Commitment Conditions in Study 4

	To-Date	To-Go
Weak Commitment	51	45
Strong Commitment	42	50

Progress Framing Continuous Ratings

To further examine participants' metamotivational beliefs of to-date and to-go progress framing, I examined their continuous ratings using a 2 (condition: weak vs. strong commitment) x 2 (progress framing: to-date vs. to-go) mixed effects ANOVA. Results revealed non-significant main effects for condition, $F(1, 186) = 0.62$, $p = .433$, $\eta_p^2 = 0.003$, and progress framing, $F(1, 186) = 2.32$, $p = .129$, $\eta_p^2 = 0.01$. The interaction between condition and framing was also non-significant, $F(1, 186) = 2.64$, $p = .106$, $\eta_p^2 = 0.01$.

Discussion

Study 4 sought to build on Study 3 by investigating whether people's consequential choices would reflect normatively accurate beliefs of to-date and to-go framing as a function of experimentally manipulated goal commitment. The relationship between commitment and

progress framing preferences in Study 3 provided evidence of normatively accurate beliefs in a real-world context, though with substantial variability in these beliefs and some evidence of less sensitivity when commitment is strong. Despite these insights from Study 3, many questions remained about the accuracy of people's beliefs and the conditions under which they use commitment as a cue for progress framing. Ultimately, participants in Study 4 did not demonstrate the pattern of normatively accurate beliefs observed in the previous studies. Specifically, the relationship between commitment condition and choice was non-significant, suggesting that progress framing choice did not differ as a function of commitment condition. The interaction between commitment condition and continuous ratings was also non-significant.

Notable, these null results are still informative, as they point to the possibility that people may not always detect or rely on commitment as a signal when making progress framing decisions. While Study 3 demonstrated a connection between commitment and framing choices in the context of personal goals—where commitment as a signal is relatively more ambiguous and complex than it is in the hypothetical scenarios—Study 4's findings indicate that this may not generalize to all contexts. As I highlighted in the Study 3 discussion, it remained unclear what aspects of the signal people might be attending to and whether it would consistently guide their choices across different contexts. The current findings—or lack thereof—present an opportunity to speculate on the nature of commitment as a signal for progress framing decisions.

One possibility for why I did not observe an effect of commitment on choice in this study is that, even though the manipulation check suggested that there was a significant difference in commitment strength between the two conditions, I may not have successfully manipulated or captured the underlying construct that might influence progress framing preferences—for instance, commitment *certainty* vs. commitment *magnitude*. Koo and Fishbach (2008) argue that

whether to-date or to-go framing is more motivating depends on one's commitment to their goal, distinguishing between commitment that is "certain and relatively high" or "uncertain and relatively low". This distinction highlights two possible dimensions of commitment strength: certainty (i.e., how confident or sure a person feels about their commitment) and commitment magnitude (i.e., the level or intensity of their commitment). Although it is likely that the two constructs are highly related, or potentially interchangeable in some contexts, it is possible that this distinction is important when it comes to assessing the normative accuracy of people's beliefs as a function of commitment. For instance, it may be possible that in the present study, I manipulated the magnitude of people's commitment, making them feel relatively more or less committed to the task, rather than the certainty of their commitment, and that this aspect of commitment certainty that people use as a signal. Indeed, although the two dimensions are often linked together in the descriptions of the original experiments (e.g., manipulating whether student participants focus on "a core-course exam, to which their commitment is certain and relatively high, or to an elective-course exam, to which their commitment is uncertain and relatively low"; Koo & Fishbach, 2008, p. 185), the researchers themselves ultimately appear to identify this key construct as "commitment certainty" in their work. Notably, the descriptions for the scenarios in the beliefs assessment I developed in Study 1 also encompass both dimensions simultaneously, making it difficult to know whether it was one aspect in particular that people were attending to.

Another possibility is that, even if the appropriate underlying construct was successfully manipulated, people may not use commitment as a guide for progress framing in this context. This is a relatively short-term, inconsequential lab task and thus it is possible that they are not experiencing commitment as a relevant signal for choice in this context. Indeed, exploring

participants' open-ended responses for why they chose to focus on their progress to-date or progress to-go, many discussed their general preferences or theories regarding how goal progress should be framed (e.g., "my philosophy in life is to never look back"), making it unclear whether commitment played a role in their decisions. However, it is also worth considering that while the construct may have been successfully captured, the differences between the commitment conditions in the present study might not be large enough to detect the differences observed in the earlier studies. Future research should design a consequential study with higher stakes, such as offering actual incentives for performance on a task for which they choose how to monitor their progress.

Yet another possibility is that participants may not have the necessary self-knowledge (e.g., insight into one's motivational states and tendencies; Miele & Scholer, 2018; Miele et al., 2020, 2024) to infer their own commitment and use it as a cue. Metamotivation work in task-motivation fit has highlighted the important role that monitoring and responding to internal motivational signals play in contributing to normative accuracy and effective implementation of beliefs. The earlier studies suggest that people have some sensitivity to these signals, as communicated via scenarios in Studies 1 and 2, and to their own levels of commitment in Studies 3a-3d. Yet, there is much still to understand about how people monitor internal motivational signals and use them to determine what motivational strategies to deploy when (Miele & Scholer, 2018; Miele et al., 2024).

Notably, the correlations between commitment and progress framing choices and ratings were not entirely consistent with the pattern of beliefs in Study 3. Specifically, Study 3 found a significant relationship between commitment and choice, such that commitment was positive correlated with choosing to-go (versus to-date), whereas the present study did not find a

significant association between the two. Although both studies found significant positive correlations between commitment and ratings of both progress framing types, the present study showed a stronger correlation with to-date ratings than to-go ratings—the opposite of Study 3, where the correlation with to-date was weaker and appeared inconsistently across samples.

One possible explanation for these discrepancies is the nature of the paradigm used in the present study. As I discussed above, the lab task was relatively short and low-stakes, which may have made participants' choices and ratings less reflective of their real-world motivational beliefs. If the task did not feel sufficiently consequential, participants may have relied on default responses or preferences instead of truly reflecting on which framing would be most motivating. Additionally, differences in study design, such as the presentation of the progress tracking choices, or differences in sample characteristics, may have contributed to the variation in findings.

In sum, Study 4 did not find evidence that changes in commitment were associated with different patterns of choice or preferences. This suggests a need for additional work to further disentangle when and in which contexts people's choices will reflect normatively accurate beliefs as a function of commitment. To further explore this issue and address some of the limitations of the study, Study 5 introduces two key changes.

First, Study 5 introduces a "neutral" commitment condition, where no information about commitment is provided, to serve as a baseline for understanding participants' preferences in the absence of commitment signals. In contrast to the previous studies, where commitment was consistently made salient—either through explicit experimental manipulations or by having participants complete a commitment measure—this neutral condition allows for the exploration of people's default preferences. Establishing a baseline provides a valuable opportunity to

explore whether individuals use commitment information as a signal or whether other factors may influence their progress framing decisions.

Second, Study 5 shifts the focus from making choices for oneself to making choices for someone else. As was discussed in the rationale for Study 1b, there can be biases or gaps in our self-knowledge regarding our personality, intelligence, and abilities (Hofer et al., 2022; Neubauer & Hofer, 2022; Vazire, 2010; Zell & Krizan, 2014), which may impact how metamotivational beliefs manifest when assessed in the context of self versus other. Although I did not find major differences in people's metamotivational beliefs using the scenario assessment in Study 1, exploring people's choices in this more consequential setting of advising others might provide a better context for detecting these potential differences and offer additional insights into the factors that influence whether commitment is used as a signal. While Study 4 did not find evidence of commitment reliably guiding framing choices, questions remain regarding whether this is due to limitations in how commitment was manipulated or measured, or if it suggests variability in when and how commitment is attended to. By exploring choices made for others, Study 5 offers an opportunity to examine whether attending to commitment as a signal varies depending on the decision-making context or perspective, thereby contributing to a deeper understanding of how and when people's choices reflect normatively accurate beliefs about to-date and to-go progress framing.

In addition to these two key changes, Study 5 also introduces an exploratory item to measure commitment certainty[14] alongside items from the Klein et al. (2014) commitment, which is more targeted towards commitment magnitude. By including measures of both

[14] Study 4 also included exploratory items intended to measure commitment certainty. However, these items primarily assessed participants' confidence in their responses to the commitment magnitude items rather than directly capturing their certainty about their commitment, making them an imprecise measure of the construct.

dimensions of commitment, Study 5 provides an opportunity to investigate whether commitment certainty and magnitude function similarly or differently in their influence on progress framing decisions. Although the main aim of Study 5 is to further examine people's metamotivational beliefs through their progress framing choices and preferences, incorporating both measures allows for a deeper exploration of how distinct aspects of commitment may influence progress framing.

Study 5

Study 5 was designed to expand on the existing consequential choice studies, which have provided mixed evidence as to whether people's behavioural choices reflect normatively accurate beliefs. In Study 5, participants made to-date and to-go progress tracking choices for *someone else*, with perceptions of the individual's goal commitment experimentally manipulated. Study 5 also introduced a "neutral" commitment condition in which there was no mention of commitment. This baseline, while primarily exploratory in nature, offered an opportunity to better understand participants progress framing preferences in the absence of explicit commitment signals and deeper insights into how commitment information may shape these preferences. Finally, Study 5 also included an exploratory item assessing perceptions of commitment certainty in addition to commitment magnitude. These changes allowed for a deeper investigation into the nature of commitment as a signal for progress framing decisions and its implications for assessing metamotivational beliefs.

In Study 5, participants were told that the researchers were working with an organization to help university students manage their goals and that they would be assigned a student profile to make goal progress tracking recommendations for the student's real-life goal. To increase the consequential nature of the task, participants were told that their responses would be used by the organization to support the student and inform the organization's approach. To manipulate perceptions of commitment, participants were randomly assigned to a fictitious student profile in which the student described their commitment to their goal as either certain and strong, relatively uncertain, or they did not mention commitment (hereby referred to as "strong", "weak", and "neutral" conditions, respectively). Participants were then presented with two detailed progress

trackers that had been designed using the popular planning app *Notion*, and were asked to choose which tracker they thought would be best for motivating the student to work towards their goal.

Given the mixed results from Studies 3 and 4, I did not have strong a priori predictions regarding people's choices and preferences. That being said, if participants in Study 5 made differential progress framing choices when commitment was manipulated in this new paradigm, normatively accurate beliefs would be reflected by choosing to-go framing in the strong commitment condition and choosing to-date framing in the weak commitment condition.

The neutral condition was included for exploratory purposes to establish a baseline for 1) people's perceptions of commitment and 2) their general progress framing preferences, in the absence of explicit commitment information. One possibility was that, without a direct reference to commitment, participants might naturally assume relatively high commitment levels—leading to patterns similar to those in the strong commitment group. However, if participants in the neutral condition reported perceptions of commitment that differ from those in the other conditions (e.g., lower than the strong commitment group but higher than the weak commitment group), their choices would be particularly informative, as any divergence in behaviour from the other conditions could suggest that people were actively using commitment as a cue when making progress framing decisions.

Method

Participants

United States-based adults ($N = 407$) were recruited from MTurk (hosted by CloudResearch) in exchange for $2.50 USD. After exclusions, there was a final sample size of $N = 398$ ($M_{age} = 43.82$, $SD_{age} = 12.66$; 202 women/transwomen, 173 men/transmen, 3 gender non-binary/fluid, 20 prefer to self-define/did not report; 78.1% White, 1.5% South Asian, 4.8% East

Asian, 1.8% mixed racial/ethnic identity, 7.5 % Black, 6% Hispanic/Latinx, 0.3% Indigenous/First Nations). This met the sample size criteria from my preregistered analysis plan (see Appendix A).

Procedure and Materials

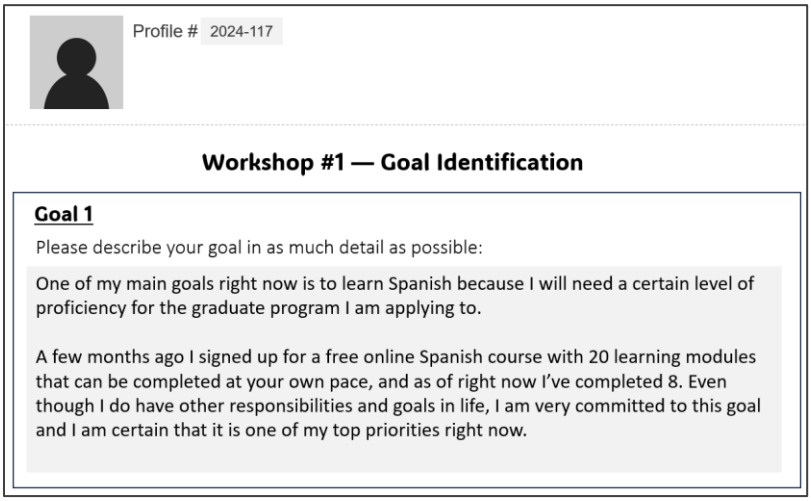
The study was advertised as investigating motivation. Participants were informed that the study examined how people motivate others. A cover story was presented which explained that the research team had partnered with an organization dedicated to helping university students manage their goals. Participants learned that the program involved a series of workshops where students identified their goals and received strategies for goal pursuit. They were told that they would be randomly assigned to a profile of a student from the program and would be making recommendations about the student's goal. To increase the consequential nature of the decision, they were told that their responses would be used to inform the organization's approach in future goal strategy workshops.

Participants then viewed a "loading screen" to stimulate that the system was randomly selecting a student profile. In reality, they were randomly assigned to one of three commitment conditions: strong (n = 134), weak (n = 129), or neutral (i.e., no information on commitment; n = 135). Participants were then presented with a fictitious student profile, which included information about the student's goal in the form of a worksheet filled out by the student (see Figure 7 for an example). The profile explained that the student had a goal to learn Spanish because they would need a certain level of proficiency for the graduate program they are applying to. They stated that they had signed up for a free online course with 20 learning modules and had completed 8 modules. In the strong commitment condition, participants read that this was one of the student's main goals, and that even though they have other

responsibilities and goals, they very committed to the goal and view it as a top priority. In the weak commitment condition, they read that this was one goal the student had right now, but that they were unsure about their commitment and uncertain whether it was a priority given other responsibilities and goals. In the neutral condition, no information about the student's commitment was provided.

Figure 7

Example of Fictious Student Profile and Goal Description (Strong Commitment Condition)



Participants were then asked to choose a progress tracker for the student for their goal. They were told that the research team had designed two different trackers using the popular planning app *Notion* to choose from and to select the trackers that would be most helpful for motivating the student to keep working towards their goal. They were presented with a description and sample of each progress tracker, with one focusing on existing progress and the other on remaining progress (counterbalanced; see Appendix H). Participants were asked which tracker they would recommend as the best choice for helping motivate the student to work toward their goal. They also rated how motivating and helpful each tracker would be for the

student. As a manipulation check, participants answered questions about their perceptions of the student's commitment to their goal.

Progress Tracker Choice and Ratings. After viewing the progress trackers, participants were asked "Which progress tracker would you recommend that the student use? Choose the tracker that you think will be most helpful for motivating the student to work toward their goal." Next, participants were asked four questions (per tracker) assessing how motivating and helpful each tracker would be for the student's goal pursuit. Specifically, using the same continuous ratings questions from Study 3, participants rated how motivating they thought each progress tracker would be for the student on a scale from 1 (*extremely demotivating*) to 7 (*extremely motivating*), and how helpful they thought each tracker would be for helping the student stay focused on their goal, make progress, and achieve goal success using a scale from 1 (*extremely unhelpful*) to 7 (*extremely helpful*). This composite showed good reliability: to-date tracker α = .96; to-go tracker α = .96.

Goal Commitment. To assess participants' perception of the student's commitment to their goal, participants responded to a total of three items. Two items were from Klein et al.'s (2014) commitment measure, with the items phrased to reference the student's commitment to their goal. Specifically, participants were told "Please answer the following questions about your perception of student's goal…": 1) "How committed is the student to their goal?" and 2) "To what extent does the student care about their goal", on a scale from 1 (*not at all*) to 7 (*extremely*). For exploratory purposes, I also created a third question that assessed participants' perceptions of the student's commitment certainty: "How certain is the student about their commitment to the goal?" As per my analysis plan, I calculated two composites: a 2-item composite comprised of the Klein et al. (2014) items, and a 3-item composite comprised of all three items. Both the 2-

item (α = .90) and 3-item (α = .94) composites showed good reliability, though the 3-item composite was slightly higher. Thus, as per my analysis plan, I used this composite in my analyses.

Results

Descriptive statistics and zero-order correlations can be found in Table 10. Although I combined the two commitment certainty items and the commitment certainty item into a single composite, I also report the descriptives and correlations for each form of commitment separately for transparency and completeness. Results indicated that the two commitment constructs were highly correlated. There was no significant correlation between commitment and progress framing choice, whereas there were significant positive correlations between commitment and both types of progress framing. I elaborate on these findings in the study discussion section.

Table 10

Descriptive Statistics and Correlations in Study 5

		M (*SD*)	1	2	3	4	5
1.	Commitment Composite (3-items)	5.43 (1.34)	-				
2.	Commitment Magnitude (2-items)	5.52 (1.27)	.98***	-			
3.	Commitment Certainty (1-item)	5.26 (1.60)	.96***	.89***	-		
4.	To-Date Tracker Ratings	5.49 (1.11)	.17***	.20***	.12*	-	
5.	To-Go Tracker Ratings	4.86 (1.34)	.22***	.20***	.24***	-.56***	-
6.	Tracker Choice (1 = to-go)	N/A	.002	-.02	.03	-.59***	.62***

* $p < .05$, ** $p < .01$, *** $p < .001$; $N = 398$

Perceived Commitment Manipulation Check

To determine whether the commitment manipulation was successful, a one-way ANOVA was conducted comparing ratings of perceived commitment between the high, low, and neutral

commitment conditions. Results revealed that the conditions significantly differed in perceived levels of commitment, $F(2, 395) = 215.45$, $p < .001$, $\eta_p^2 = 0.52$.

Post-hoc analyses revealed that participants in the strong commitment condition ($M = 6.40$, $SD = 0.71$) rated the student as significantly more committed than those in both the neutral ($M = 5.77$, $SD = 0.97$) and weak ($M = 4.08$, $SD = 1.09$) commitment conditions; the neutral condition also had higher commitment ratings than those in the weak commitment condition ($ps < .001$). Thus, it appears that the manipulation was successful for the key comparison of interest—that is, the strong versus weak commitment conditions. The neutral condition, which was included for exploratory purposes, was found to be lower than the strong commitment condition, but higher than the weak commitment condition, suggesting that participants in this condition assumed a moderate level of commitment, relative to the other conditions.

Progress Tracker: Binary Choice

I conducted a chi-square test of independence to examine the relationship between commitment condition and progress framing choice. The relationship was non-significant, $X^2(2, N = 398) = 0.93$, $p = .628$ (see Table 11 for progress choice frequencies).

Table 11

Frequencies of Progress Framing Choices for Commitment Conditions in Study 5

		Tracker Choice Frequencies	
Condition	*N*	To-Date	To-Go
High	134	82	52
Neutral	135	90	45
Low	129	84	45

Progress Tracker: Continuous Ratings

To examine whether participants progress tracker ratings differed by condition, a 2 (progress framing: to-date vs. to-go) x 3 (commitment condition: high vs. low vs. neutral) mixed-effects ANOVA was conducted. Results revealed that there was no significant progress framing x condition interaction, $F(2, 394) = 0.79$, $p = .456$, $\eta_p^2 = .04$.[15] However, there was a main effect of progress framing such that participants rated the to-date tracker (M = 5.49, SD = 1.11) as significantly more motivating than the to-go tracker (M = 4.86, SD = 1.34) , $F(1, 394) = 41.55$, $p < .001$, $\eta_p^2 = .10$. There was also a significant main effect of condition, $F(2, 394) = 7.05$, $p < .001$, $\eta_p^2 = .04$. Follow-up Tukey post-hoc tests revealed that participants in the strong commitment condition ($M = 5.33$, $SD = 0.78$) reported significantly higher motivation ratings overall compared to the weak commitment condition ($M = 4.99$, $SD = 0.71$), $p < .001$; the neutral commitment condition ($M = 5.20$, $SD = 0.73$) also reported higher motivating ratings compared to the weak commitment condition, $p = .019$. There was no significant difference between the high and neutral commitment conditions, $p = .172$.

Discussion

Study 5 was designed to test whether experimentally manipulating commitment would lead to differences in participants' progress framing choices and whether these choices would reflect normatively accurate beliefs using a new paradigm. By introducing a new paradigm in which participants made progress framing recommendations for someone else's goal, this study sought to further examine whether people's choices and preferences reflected normatively accurate beliefs. Study 5 also introduced a neutral commitment condition to serve as a baseline

[15] As per my analysis plan, I also conducted planned contrasts with the strong and weak commitment conditions. Results revealed that those in the strong commitment condition rated to-go as significantly more motivating for the student than those in the weak commitment condition; see Appendix H for details.

for understanding people's default perceptions of commitment and their progress framing preferences when commitment information is not explicitly provided.

Despite these methodological changes, Study 5 did not find evidence that differences in commitment were associated with different patterns of choice in this setting. Specifically, the relationship between commitment condition and choice was non-significant, suggesting that progress framing choice did not differ as a function of commitment condition. The interaction between commitment condition and continuous ratings was also non-significant. Notably, similar to Study 4, the correlational results revealed significant positive associations between commitment and ratings of both progress framing types, but no significant correlation between commitment and progress framing choice. However, in this case, the strength of the correlation between commitment and to-go was slightly stronger than the correlation between commitment and to-date—a pattern that aligns more closely with Study 3, though some differences remain.

The inclusion of the neutral commitment condition did yield some valuable insights. The commitment manipulation was successful, with participants in the neutral condition reporting perceptions of commitment that were significantly lower than those in the strong commitment condition but higher than those in the weak commitment condition. This suggests that, in the absence of explicit information, participants assume a moderate level of commitment, rather than defaulting to either strong or weak commitment assumptions. This finding could have implications for how individuals make judgments about others' goal pursuit in the absence of explicit commitment information.

Regarding baseline progress framing preferences, participants generally preferred to-date framing over to-go framing across all conditions, as demonstrated in both their binary choices and continuous ratings of the progress trackers. Notably, while participants' perceptions of

commitment varied across conditions as expected, these differences did not translate into different patterns of binary choices or continuous ratings of to-date and to-go progress framing. In Study 4, I discussed the possibility that people may not use commitment as a guide for progress framing in that context. Study 5 attempted to address this by testing these relationships in a new context (i.e., making recommendations for a student's goal) and adding the neutral commitment condition. However, given that I still did not find a link between changes in commitment and progress framing choices, this suggests it is still unclear when and if commitment is being used as a signal for progress framing decisions.

Beyond the question of whether participants are using commitment as a signal, there are additional possibilities for why I did not observe an effect of commitment on choice in this study. First, although participants were told they were making real recommendations that would be used to inform future workshops, they may not have been as invested in their choices as they would be in a real-world mentoring or coaching scenario. That is, despite efforts to increase the consequential nature of the decision, participants may have perceived the stakes as relatively low, which may have resulted in a lack of truly reflecting on which framing would be most motivating for the student's goal. Furthermore, if participants were skeptical about the validity of the cover story, this also could have made the choice feel inconsequential.

Second, the overall preference for to-date framing observed across conditions may reflect characteristics of the progress trackers themselves rather than participants beliefs about the effectiveness of to-date progress framing. For instance, it is possible that participants found the to-date tracker visually more appealing or intuitive. Thus, the design or the presentation of the trackers may have created a bias toward one option that outweighed the potential influence of

commitment information. This also may have contributed to the positive correlation between commitment and to-date framing.

Third, as discussed in Study 4, I considered whether I had successfully manipulated or captured the underlying construct that might influence progress framing preferences—that is, commitment certainty versus commitment magnitude. In Study 5, I included a measure of commitment certainty alongside commitment magnitude to explore whether these constructs are distinct and whether that distinction might influence the relationship between commitment and progress framing choices. The results suggest that the two constructs are highly correlated, at least in the present context. This high correlation may be due in part to the language used in the manipulation, which explicitly referenced both commitment level and certainty, potentially conflating the two concepts. I revisit this issue in the general discussion.

In sum, Study 5 highlights the complexity of capturing when and in which contexts people's progress framing choices will reflect normatively accurate beliefs. Although the findings did not reveal significant associations between commitment condition and choice, there were some valuable insights into how individuals perceive commitment in the absence of explicit signals. The inclusion of the neutral condition and the exploration of both commitment magnitude and certainty offered a step toward better understanding those constructs. However, these findings also emphasize the need for continued exploration of the nuanced role of commitment as a signal for progress framing, contributing to the broader goal of assessing people's metamotivational beliefs.

Studies 1-5 focused on exploring people's metamotivational beliefs and whether they recognize when and how to flexibly deploy to-date and to-go progress framings to support motivation. Yet, I also wanted to explore whether these beliefs are related to self-regulatory

outcomes. Therefore, Study 6 used a longitudinal design to examine whether metamotivational knowledge at Time 1 predicted future goal progress and success. It also explored whether people's beliefs predicted a more distal measure of well-being: life satisfaction.

Study 6

Existing metamotivation research in other domains has demonstrated a link between beliefs and various outcomes, such as performance benefits for those who hold more normatively accurate metamotivational beliefs (MacGregor et al., 2017; Nguyen et al., 2022; Ross et al., 2023). Therefore, Study 6 was designed to examine whether there would be a similar link between progress framing beliefs and outcomes. Specifically, Study 6 aimed to explore whether having more normatively accurate beliefs about progress framing predicted greater goal progress and success. In addition to this relatively direct outcome of goal progress, I also wanted to explore a more distal well-being outcome (i.e., life satisfaction).

To do this, I conducted a longitudinal study assessing people's metamotivational beliefs, personal goals, and life satisfaction at two time points. At Time 1, participants identified and answered questions about three short-term goals, and completed the scenario-based assessment from Study 1a along with a battery of other measures (e.g., life satisfaction). At Time 2 (two weeks later), participants reported on their goal progress (% completed) and perceived goal success (3-item scale; Chua et al., 2021), along with the other measures from Time 1 (e.g., beliefs assessment, life satisfaction). Notably, this design also allows for the opportunity to look at test-retest reliability of these beliefs.

Based on prior work that has demonstrated a link between normatively accurate metamotivational beliefs and outcomes in other domains, I hypothesized that those with more normatively accurate beliefs about the differential effects of to-date and to-go goal progress framing would make greater progress on their goals and have higher levels of perceived goal progress. I did not have strong predictions regarding life satisfaction, but thought it was possible that there would be a positive relationship between normatively accurate beliefs and higher life

satisfaction. That being said, given the potential complexities of when these beliefs may be most relevant in goal pursuit, it is also possible that no effects will be observed.

Method

Participants

Undergraduate participants completed an online study in exchange for course credit. An a priori power analysis in G*Power based on correlational analyses. The analysis showed that a sample size of 319 would provide 95% power to detect an effect size of $\rho = .20$ (small-to-medium effect size, based on prior work and the typical effect sizes observed in Kashdan et al., 2020). This would also provide adequate power for the beliefs assessment analysis, as per sample size estimates from the previous studies. To account for potential exclusions, attrition[16], and the possibility of smaller effect sizes, I aimed to recruit as close to 400 participants as possible before the end of the academic term, depending on the availability of the participants in the participant pool. Further, although I had originally conducted the power analysis for correlational analyses, I ultimately determined that the most appropriate analyses to conduct for these studies were mixed-effects models due to the repeated-measures design, likely making these power estimates conservative (though correlational analyses were also conducted and results were consistent across approaches).

For Time 1, a total of 312 participants completed the online study. Due to the minimum amount of time between both parts being two weeks with up to a week completion time, I closed Time 1 sign-ups roughly three weeks before the end of the semester, with 235 participants

[16] It was a requirement that participants be awarded credit separately for Time 1 and Time 2 sessions. This created an obstacle for Time 2 retention rates, because many participants had already received their maximum credits by the time they were eligible for the Time 2 session. Participants also needed to respond to an email to participate in Time 2 because embedded data from Time 1 (self-entered short-term goals) needed to be transferred through a unique link.

completing both parts. After exclusions were applied to both parts, the final sample size was N = 202 (M_{age} = 20.71, SD_{age} = 5.12; 151 women/transwomen, 48 men/transmen, 2 gender non-binary/fluid, 1 did not report; 33.2% White, 24.3% South Asian, 30.2% East Asian, 5.4% mixed racial/ethnic identity, 4% Middle Eastern, 2.5% Black). A sensitivity analysis revealed that I had 95% power to detect an effect size as small as ρ = .25.

Procedure and Materials

Participants were told that this was a study investigating goal pursuit, conducted over two time points. First, at Time 1, participants nominated three short-term goals and answered various questions about each goal, including measures of goal progress, goal commitment, and other goal-related properties. Participants then completed the scenario-based beliefs assessment from Study 1a and a measure of life satisfaction (order was counterbalanced). After two weeks (Time 2), participants were sent a link to complete the second part of the study, which was then available for a period of seven days. First, participants were reminded of their goals specified at Time 1 and then were asked questions about their goal progress as well as perceived goal success for each goal. Participants then completed the beliefs assessment and life satisfaction measures from Time 1. Participants also completed additional goal-related and individual difference measures unrelated to the primary focus of my dissertation; details are presented in Appendix B.

Short-Term Goal Nomination (Time 1). Participants were asked to "list 3 short-term goals, in no particular order, that you want to complete within the next two weeks. They were given a list of examples, including "Save $100 to purchase a new desk chair; Exercise 10 times (5 per week); Complete all 4 discussion posts for Psych353; Lose 2 pounds."

Initial Goal Progress (Time 1). For each goal, participants were asked "as of right now, how much progress (as a percentage) have you made toward your goal to [goal]?" Participants indicated their response using a slider scale from 0 (No Progress) to 100 (Goal Completed).

Goal Commitment (Time 1). Participants completed a 3-item scale used by Chua et al. (2021; derived from Hollenbeck et al. 1989; Sheldon & Kasser, 1998) that measures the degree to which individuals are committed to their goals. For each goal, participants answered three questions assessing their commitment to the goal on a scale from 1 (*not at all*) to 5 (*extremely*), including "How committed are you to accomplishing this goal?", "How meaningful is this goal to you?", and "How upset would you be if you failed to accomplish this goal?"

Total Goal Progress (Time 2). Participants were once again asked to indicate how much progress they had made towards each goal on a sliding scale from 0-100%, with directions to answer the question based on total goal progress since goal pursuit began (as opposed to how much progress had been made since Time 1, as participants were allowed to list goals that they had already made some progress on); "*how much progress have you made toward your goal to [insert goal]* ***since you began pursuing the goal***?" Total goal progress for each individual goal was calculated by subtracting Time 1 progress from Time 2 progress.

Perceived Goal Progress (Time 2). Participants completed a 3-item scale used by Chua et al. (2022; see also Koestner et al., 2012) that measures perceptions of goal progress and success. For each goal, participants answered three questions on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*): "I put a lot of time and effort into achieving this goal", "I am making good progress on my goal" and " I am satisfied with the progress I am making towards this goal."

Life Satisfaction (Time 1 and 2). Participants completed the Satisfaction with Life Scale (Diener et al., 1895), which consists of 5-items assessing one's satisfaction with their life. Example items include "*In most ways my life is close to my ideal*" and "*I am satisfied with my life*"; items were rated on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*).

To-Date/To-Go Metamotivational Beliefs Assessment (Time 1 and 2). Participants completed the scenario-based metamotivational beliefs assessment from Study 1a.

Results

Descriptive Statistics, Correlations, and Test-Retest Reliability

Participants demonstrated a pattern of metamotivational beliefs consistent with the earlier studies at both time points (see Appendix E). Using the formula from Study 2, the metamotivational knowledge index revealed that on average participants had normatively accurate beliefs at Time 1 ($M = 0.51$, $SD = 1.12$; min = -2.63, max = 4.13) and Time 2 ($M = 0.69$, $SD = 1.42$; min = -2.88, max = 4.88).

Descriptive statistics and zero-order correlations can be found in Tables 12 and 13, respectively. Results revealed that neither Time 1 or Time 2 knowledge were significantly correlated with goal progress, perceived goal success, or life satisfaction.

To examine the stability of to-date/to-go metamotivational beliefs assessment, I examined the Pearson correlation coefficient between knowledge at Time 1 and Time 2 (2-3 weeks later). The test-retest reliability of the beliefs assessment was .30 ($p < .001$).

Table 12

Descriptive Statistics for Continuous Variables in Study 6

	T1 Beliefs	T2 Beliefs	T2 Total Goal Progress	T2 Perceived Success	T1 Commitment	T1 Life Sat	T2 Life Sat
Min/Max			-28.67[17] - 96.67	1.89 - 6.89	1-5	1-7	1-7
M	0.51	0.69	26.28	4.83	4.04	4.39	4.36
(*SD*)	(1.12)	(1.42)	(23.25)	(1.07)	(0.56)	(1.29)	(1.30)

Note. T1 = Time 1, T2 = Time 2

Table 13

Correlations Between Continuous Variables in Study 6

	1	2	3	4	5	6
1. T1 Beliefs	-					
2. T2 Beliefs	.30***	-				
	[.17, .42]					
3. T2 Goal	.004	.11	-			
Progress	[-.13, .14	[-.03, .24]				
4. T2 Perceived	-.07	-.03	.38***	-		
Success	[-.20, .07]	[-.17, .11]	[.25, .49]			
5. T1	-.06	-.01	.08	.31***	-	
Commitment	[-.20, .07]	[-.15, .13]	[-.05, .22]	[.17, .43]		
6. T1 Life Sat	-.08	.04	-.02	.24***	0.08	-
	[-.22, .06]	[-.10, .18]	[-.16, .12]	[.11, .37]	[-.06, .21]	
7. T2 Life Sat	-.05	.04	.11	.33***	.04	.74***
	[-.19, .09]	[-.10, .18]	[-.03, .24]	[.20, .45]	[-.10, .17]	[.68, .80]

Note. T1 = Time 1, T2 = Time 2

[17] Because goal progress was calculated by subtracting progress at time 1 from time 2, some participants reported less progress at time 2 than they did at time 1, resulting in some participants having a negative amount of goal progress. Although unlikely, it is theoretically possible, and therefore given that this was not included as an a prioi exclusion criteria, I included these participants (n = 27) in the analyses. Notably, however, exploratory analyses excluding those who reported negative progress did not change the results.

Metamotivational Beliefs at Time 1 Predicting Outcomes at Time 2

Due to the repeated measures design, including the three goals listed per participant, the following analyses examining goal progress and perceived goal success all used mixed-effects models to account for the random effects of participants and goals by estimating random intercepts for each. In the analyses predicting life satisfaction, participant was the only modeled random effect.

Goal Progress and Perceived Success. I examined whether metamotivational beliefs at Time 1 predicted goal progress and perceived goal success at Time 2. Results revealed that beliefs at Time 1 did not significantly predict goal progress, $b = 0.01$, $SE = 1.49$, $t(203) = 0.01$, $p = .996$, or perceived goal success, $b = -0.006$, $SE = .07$, $t(200) = -0.95$, $p = .344$, at Time 2.[18]

Life Satisfaction. I examined whether metamotivational beliefs at Time 1 predicted life satisfaction at Time 2, controlling for life satisfaction at Time 1. Results revealed that while Time 1 life satisfaction was a significant predictor, $b = 0.75$, $SE = .05$, $t(199) = 15.67$, $p < .001$, metamotivational beliefs were not, $b = 0.01$, $SE = .05$, $t(199) = 0.25$, $p = .805$.

Discussion

The goal of this study was to examine whether having more normatively accurate beliefs about to-date and to-go progress framing would predict future goal outcomes and life satisfaction. Using a longitudinal design, I assessed participants' metamotivational beliefs at Time 1, along with their initial goal progress on three self-selected short-term goals, and then measured their goal progress, perceived success, and life satisfaction two weeks later. All results were non-significant, suggesting that metamotivational beliefs about progress framing did not predict goal progress, perceived success, or life satisfaction.

[18] Exploratory analyses controlling for goal commitment did not change the results.

The test-retest reliability of the beliefs assessment was .30. This is fairly consistent with the test-retest reliability of other metamotivational knowledge assessments. For instance, the regulatory focus task-motivation fit metamotivational knowledge assessment, which was .48 for total knowledge, .51 for eager knowledge, and .34 for vigilant knowledge (Ross et al., 2023), and the construal level metamotivational knowledge assessment, which was .28 for high-level knowledge and .42 for low-level knowledge (Nguyen et al., 2022). Correlations of this strength reflect both stability and variability in metamotivational knowledge, as would be expected for beliefs that may change over time as a function of experience, though the relatively low correlation for a time period of only two weeks is notable (for another example, see Kashdan et al., 2020, for the test-retest reliability of the PPFI).

Several factors may have contributed to why I did not observe a link between knowledge and outcomes in this study. First, the measures relied on participants' perceptions and self-reports of their progress and success. While assessing goal progress as a percentage offers a slightly more concrete metric than purely subjective ratings, it still depends on participants' own judgment rather than objective indicators of achievement, which can result in inaccuracies (Chang et al., 2017). Compounding this issue, because there was such a vast range of goals, there were no consistent standards for performance and therefore what counted as "progress" or "success" likely varied widely across participants. This variability may have blurred potential relationships between beliefs and actual outcomes, making effects harder to detect. These effects might be easier to observe in studies with standardized goals or controlled settings. For instance, previous research linking metamotivational knowledge to outcomes has often used goals with clear performance metrics, such as accuracy on a proofreading task or final grades in a university course (Ross et al., 2023), which may be more sensitive to capturing the influence of beliefs on

success. Additionally, the two-week time frame for the study may have limited the ability to observe meaningful changes in goal progress or success, particularly for goals that might require sustained effort or involve longer-term pursuits.

Furthermore, examining beliefs in this domain offers a unique challenge such that, unlike other motivational domains that have been studied, these beliefs might be particularly relevant at specific phases of goal pursuit, which may make it harder to capture a relationship between beliefs and outcomes. As I have discussed, it is possible that a strategic focus on progress to-date versus progress to-go may be particularly important when people are in the middle of goal pursuit, as this is when motivation is often at its lowest and thus would benefit the most from a strategy to upregulate motivation quantity (Bonezzi et al., 2011). Thus, in contrast to metamotivational beliefs about regulatory focus or construal level—which often have the opportunity to be relevant during the various stages of goal pursuit and have been shown to be related to outcomes—beliefs in this domain may potentially be more constrained in when they are going to be relevant for goal pursuit, which might have implications for capturing whether knowledge relates to self-regulatory outcomes.

Notably, participants in the present study were not constrained to choose goals that were at the midpoint and thus participants' starting timepoints of goal pursuit varied greatly. I ran some exploratory analyses to investigate this possibility, examining whether progress at Time 1 moderated the relationship between beliefs and outcomes. I did not find evidence to support this possibility, though it is possible that I was too underpowered to detect those relationships. Thus, an improved study design that more carefully controls for variables such as goal phase and duration might allow for better detection of these potential relationships.

More broadly, there are many factors that may influence the likelihood of knowledge being translated into outcomes during real-life goal pursuit. One possibility is that, even if people hold normatively accurate beliefs about progress framing, these beliefs may not be strong or salient enough to meaningfully shape their goal experiences. Another possibility is that, although people may have accurate metamotivational knowledge regarding the if-then contingencies of to-date and to-go progress framing, they may lack the necessary self-knowledge for effective implementation. Miele and Scholer (2018) argue that internal signals play an important role in metamotivational monitoring and regulation. If people lack self-insight regarding their level of motivation or commitment, they may not have the opportunity to translate their beliefs about to-date and to-go progress framing into meaningful actions. I expand on the issue of self-knowledge and its implications for the assessment of metamotivational beliefs in the general discussion.

In conclusion, while Study 6 did not find evidence that normatively accurate beliefs about progress framing predict goal outcomes, this may reflect the complexity of detecting how and when these beliefs might be relevant for goal pursuit and other self-regulatory outcomes. The next study adopted a different approach, exploring the role of these metamotivational beliefs in goal pursuit in a broader context by assessing various aspects of people's experiences with their goal pursuit more generally.

Study 7

Existing metamotivation research in other domains has demonstrated a link between beliefs and various outcomes. Study 6 did not provide evidence that normatively accurate beliefs predicted future goal progress/success or life satisfaction, suggesting that capturing the relationship between these beliefs and outcomes may not be a straightforward progress. Study 7 aimed to further explore this relationship by examining how to-date/to-go progress framing beliefs relate to goal pursuit more broadly, both in the context of daily experiences and long-term personal goals. To do this, I employed a paradigm modelled after a multimethod study conducted by Kashdan et al. (2020), which examined the relationship between psychological flexibility (the ability to pursue valued life aims despite the presence of distress, as measured by the PPFI) and goal-related activity and experiences.

In Study 7, participants completed a Day Reconstruction task and a Personal Strivings packet, along with the scenario-based beliefs assessment from Study 1. In the Day Reconstruction task, participants identified five different episodes from the previous day and reported their experiences with the goal they were trying to achieve during each episode, including difficulty, competence, effort, distress, joy, meaning, control, values-consistency, progress, and autonomy. In the Personal Strivings packet, participants identified six personal, important goals and answered questions assessing constructs such as meaning, joy, difficulty, effort, autonomy, and success experienced during each striving.

The goal of Study 7 was to explore whether people's metamotivational beliefs were related to their experiences with their everyday goal pursuit. Given the lack of compelling evidence thus far as to whether people's behaviour choices reflect normatively accurate beliefs and that these beliefs are linked to goal progress, I did not have strong expectations that I would

observe such a relationship in the present study. Further, given the broader range of goal-related experiences included in the current paradigm (many of which were included for the sake of consistency with the original study and not necessarily because I predicted they would have a strong relationship with metamotivational knowledge, such as expecting one's striving to be important in the future, or that one's striving benefits other people), I did not have strong predictions regarding specific relationships. However, I did speculate on some possibilities.

Given prior work demonstrating that having more normatively accurate metamotivational beliefs in other domains predicted performance and other outcomes (Hubley et al., 2024; Nguyen et al., 2019; Ross et al., 2023), I believed it was possible that metamotivational knowledge would be associated with reports of higher goal progress and success in people's daily and long-term goal pursuit experiences. Although Study 6 did not find that knowledge predicted more goal progress and success in that paradigm, I believed that exploring these variables in a broader context encompassing a wider range of goals—including the objectives that people are pursuing in the day-to-day as well as people's major long-term goals—might provide a richer context to detect some of these relationships.

It is also possible that having more normatively accurate beliefs could be associated with certain aspects of goal pursuit that may be easier to detect when examining experiences with goal-related activity more generally. As the metamotivational framework suggests, knowledge may be relatively tacit or implicit (Scholer & Miele, 2016; Wagner & Sternberg, 1985). Thus, it may be that knowledge is connected to more subtle aspects of goal pursuit, such as a general underlying belief that one is capable or in control during goal pursuit, or feeling clear about how to work towards one's goals and experiencing the process as less difficult or distressing.

It is also worth considering insights from the study after which the present research is modelled. Specifically, the PPFI assesses whether people are able to capitalize on or harness distress and other negative experiences to motivate and facilitate goal pursuit (Kashdan et al., 2020). While this is certainly distinct from to-date and to-go knowledge as a construct, one could say there is some conceptual overlap in the sense that this knowledge reflects an understanding that focusing on all the progress that one has left to complete, which could be experienced as stressful or overwhelming in many circumstances, can also be a powerful motivational strategy. Thus, it is worth briefly summarizing what Kasdan and colleagues observed in their study as this may provide some insights into what one might expect to find in the present study, while again acknowledging that these are distinct constructs and therefore it is not necessarily the case that they would relate to goal-related experiences in the same way. In their study, Kashdan et al. (2020) found that higher scores on the PPFI was associated with many beneficial goal-related experiences, including less goal interference from distress, a greater sense of goal-related competence and control, higher levels of effort, and more goal progress overall. They also found that participants who had more psychological flexibility derived more joy and meaning from their goal pursuit, as well as perceptions that their strivings were part of who they are and expectations that their strivings will be important in the foreseeable future.

Ultimately, while I was uncertain whether I would observe a connection between knowledge and these goal-related experiences due to the potential complexities of detecting such relationships, this paradigm provided an intriguing framework to explore various aspects of goal pursuit in a broader context.

Method

Participants

Undergraduate participants ($N = 378$) completed an online study in exchange for course credit. After exclusions, there was a final sample size of $N = 316$ ($M_{age} = 20.77$, $SD_{age} = 10.54$; 228 women/transwomen, 81 men/transmen, 2 gender non-binary/fluid, 5 prefer to self-define/did not report; 33.4% White, 30.4% South Asian, 16.1% East Asian, 7.6% mixed racial/ethnic identity, 5.1% Middle Eastern, 5.4% Black, 1.6% Hispanic/Latinx). To determine an estimated sample size, I conducted an a priori power analysis in G*Power based on correlational analyses. The analysis showed that a sample size of 319 would provide 95% power to detect an effect size of $\rho = .20$ (small-to-medium effect size, based on prior work and the typical effect sizes observed in Kashdan et al., 2020). This would also provide adequate power for the beliefs assessment analysis, as per sample size estimates from the previous studies. To account for potential exclusions and the possibility of smaller effect sizes, the stop rule was to recruit as close to 400 participants as possible before the end of the academic term, depending on the availability of the participants in the participant pool. Further, although I had originally conducted the power analysis for correlational analyses, I ultimately determined that the most appropriate analyses to conduct for these studies were mixed-effects models due to the repeated-measures design, likely making these power estimates conservative (though correlational analyses were also conducted and results were consistent across approaches).

Procedure and Materials

The study was advertised as examining beliefs about motivation and goals. In randomized order, participants completed the Day Reconstruction Task, the Personal Strivings Packet, and the scenario-based beliefs assessment.

Day Reconstruction Task. Participants completed the Day Reconstruction Task, which was a modified version of the Day Reconstruction Method (Kahneman et al., 2004; Kashdan et al., 2020). Participants were asked to identify and describe five significant episodes from the previous day, focusing on moments that were particularly impactful, meaningful, or moments that stood out. Participants then answered various questions about their activities for each episode chronologically. Specifically, using an adapted version of the episode questions used by Kashdan et al. (2020), participants provided a general description of what they were doing, thinking, and feeling, then identified the action they were engaging in (e.g., eating, working, relaxing, socializing) and their location (home, work, or other), and provided a description of their primary goal of the episode. Participants then answered questions related to difficulty, competence, effort, distress, joy, meaning, control, values-consistency, progress, and autonomy, as they related to their "central goal or desired outcome during this episode (questions created by Kashdan et al., 2020, adapted from Emmons, 1986) on a scale from *1 (not at all)* – 5 *(very much)*. Example items include "how challenging did you find this goal?", "how capable did you feel while working on this goal?", and "to what extent did you make progress towards your goal?"

Personal Strivings Packet. To assess broader life strivings, participants completed a modified version of a Personal Strivings Packet (Kashdan et al., 2020, adapted from Emmons, 1986). Participants were asked to think about their personal, major life goals they wanted to accomplish in life that were guiding their everyday behaviour. They were given examples of general categories their strivings might fall into (e.g., "trying to improve my relationships") and how that might appear more specifically as their own personal goals (e.g., "trying to treat all of my students the same way I treat my daughter"). After participants listed their six strivings, they

then answered a series of 11 questions that assessed how they felt over the past month for each striving. The questions covered a range of topics, including centrality, self-organization, life aim, purpose, effort, difficulty, past success, support, joy, autonomy, and generativity, using a scale from *1 (not at all) – 5 (very much).* Example items include "you are clear about how to work toward your striving.", "how much time and effort did you devote to being successful in your striving?" and "how successful have you been in your striving?"

To-Date/To-Go Metamotivational Beliefs Assessment. Participants completed the scenario-based metamotivational beliefs assessment from Study 1a.

Results

Participants demonstrated a pattern of metamotivational beliefs generally consistent with the earlier studies, though the simple effect for strong commitment was not significant, as in Study 1b (see Appendix E). Using the formula from Study 2, the metamotivational knowledge index revealed that on average participants had normatively accurate beliefs ($M = 0.51$, $SD = 1.40$; min = -7.38, max = 6.63) significantly greater than 0, $t(315) = 6.44$, $p < .001$, $d = 1.40$). Descriptive statistics and item descriptions for the goal-related variables can be found in Table 14.

Metamotivational Beliefs and Goal Pursuit Experiences

Given the repeated measures design, analyses used linear mixed-effects models to account for the random effect of the participant.[19]

For the daily episodic goals, results revealed that having more normatively accurate metamotivational beliefs was significantly associated with less goal interference due to distress

[19] Models including the random effects of either daily episode or personal striving resulted in convergence issues. Thus, only the random effect of participant is included in the present analyses. Correlational analyses were also conducted by averaging items across episodes/strivings; results are consistent with the analyses presented here.

("*how much did anxiety and pain interfere with work on this goal*"), b = -0.08, p = .027, and marginally associated with experiencing the goals as less challenging ("*how challenging did you find this goal*"), b = -0.06, p = .053 (see Table 15). Further, when examining experiences with personal strivings over the past month, having more normatively accurate beliefs was significantly associated with experiencing less difficultly with goal pursuit success, "*how difficult was it to be successful in your striving? Think about the obstacles you encountered, how much demand each project place on you, your opportunity to succeed, etc*."), b = -0.05, p = .041 as well as reports of goals being less beneficial to other people ("*how much does your striving benefit other people*"), b = -0.08, p = .031.

Table 14

Descriptive Statistics and Item Descriptions for Goal-Related Variables in Study 7

Variable	Item	*M*(*SD*)
Day Reconstruction		
Challenge	*How challenging did you find this goal?*	2.66 (0.77)
Capable	*How capable did you feel while working on this goal?*	3.61 (0.72)
Effort	*How hard did you work on this goal?*	3.10 (0.78)
Distress	*How much did anxiety and pain interfere with work on this goal?*	2.41 (0.89)
Joy	*To what degree did you experience joy did from working toward this goal?*	3.53 (0.73)
Meaning	*To what degree did you experience a sense of meaning from working toward this goal?*	3.45 (0.82)
Control	*To what degree did you feel in control while working toward this goal?*	3.64 (0.72)
Value	*To what extent was your goal consistent with the values that guide your life?*	3.70 (0.69)
Progress	*To what extent did you make progress towards your goal?*	3.86 (0.70)
Autonomy	*To what extent did you engage in this goal of your own free will, not because anyone else wanted you to do it?*	4.06 (0.71)
Personal Strivings		
Centrality	*It is part of who you are to pursue your striving.*	4.10 (0.72)
Self-Organizing	*You are clear about how to work toward your striving.*	3.82 (0.73)
Life Aim	*You expect your striving to be important for you in the foreseeable future.*	4.34 (0.64)
Purpose	*How much purpose and meaning do you derive from your striving?*	4.17 (0.64)
Effort	*How much time and effort did you devote to being successful in your striving?*	3.50 (0.75)
Difficulty	*How difficult was it to be successful in your striving? Think about the obstacles you encountered, how much demand each project place on you, your opportunity to succeed, etc.*	3.74 (0.67)
Success	*In the past month, how successful have you been in your striving?*	3.17 (0.69)
Support	*In the past month, how much support have you received from significant others in your striving?*	3.28 (0.86)
Joy	*How much joy do you experience when you are successful in your striving?*	4.18 (0.62)
Autonomy	*To what degree are you able to decide how to pursue your striving?*	3.77 (0.66)
Generativity	*How much does your striving benefit other people?*	3.26 (0.92)

Table 15

Metamotivational Beliefs Predicting Day Reconstruction and Personal Striving Goal Experiences in Study 7

Goal-Related DV	*b*	*SE*	*t*	*p*	95% CI
Day Reconstruction					
Challenge	-0.06	0.03	-1.94	**.053**	-0.12, 0.0006
Capable	0.04	0.03	1.43	.153	-0.02, 0.10
Effort	0.03	0.03	0.94	.349	-0.03, 0.09
Distress	-0.08	0.04	-2.22	**.027**	-0.15, -0.01
Joy	0.03	0.03	1.09	.277	-0.03, 0.09
Meaning	0.005	0.03	0.14	.886	-0.06, 0.07
Control	0.04	0.03	1.34	.180	-0.02, 0.10
Value	0.03	0.03	0.93	.353	-0.03, 0.08
Progress	0.03	0.03	1.19	.235	-0.02, 0.09
Autonomy	-0.002	0.03	-0.08	.937	-0.06, 0.05
Personal Strivings					
Centrality	0.02	0.03	0.67	.502	-0.04, 0.08
Self-Organizing	0.02	0.03	0.85	.398	-0.03, 0.08
Life Aim	0.03	0.03	1.16	.245	-0.02, 0.08
Purpose	0.01	0.03	0.40	.691	-0.04, 0.06
Effort	-0.03	0.03	-1.06	.290	-0.09, 0.03
Difficulty	-0.05	0.03	-2.05	**.041**	-0.11, 0.03
Success	-0.04	0.03	-1.27	.204	-0.09, 0.02
Support	-0.04	0.03	-1.12	.262	-0.11, 0.03
Joy	0.01	0.02	0.46	.649	-0.04, 0.06
Autonomy	0.03	0.03	1.04	.299	-0.02, 0.08
Generativity	-0.08	0.04	-2.16	**.031**	-0.15, -0.01

Discussion

Study 7 aimed to examine how metamotivational beliefs about progress framing related to individuals' experiences with everyday goal pursuit. Employing a multimethod approach, I explored whether having more normatively accurate beliefs about to-date/to-go progress framing was associated with goal-related experiences across both short-term (daily episodes) and long-term (personal strivings) contexts.

The results provided some evidence that metamotivational beliefs are linked to goal pursuit experiences, though the effects were relatively small. In the Day Reconstruction Task, participants with more normatively accurate beliefs reported experiencing less goal interference due to distress and marginally lower perceptions of their goals being challenging. These findings suggest that having a better understanding of how progress framing impacts motivation might be associated with perceiving daily goal pursuit as less taxing or difficult. However, there were no significant associations between metamotivational beliefs and other key aspects of daily goal experiences, such as feelings of competence, effort, joy, meaning, control, values-consistency, progress, or autonomy.

Similarly, in the Personal Strivings Packet, more normatively accurate beliefs were associated with perceiving goal pursuit as less difficult. This is consistent with the Day Reconstruction results, providing further support for the idea that accurate metamotivational beliefs may help individuals navigate goal pursuit with fewer perceived obstacles. A somewhat unexpected finding was that beliefs were associated with perceiving one's goals as being less beneficial to others. This relationship was not hypothesized and does not have a clear theoretical relationship, but it is possible that people with more accurate beliefs prioritize personal goal pursuit over prosocial goal engagement, though this is purely speculative.

The association between metamotivational knowledge and generally lower experiences of challenge and distress during goal pursuit observed in the present study could suggest that metamotivational knowledge in this domain may be particularly beneficial for reducing negative experiences in goal pursuit, rather than increasing positive ones. This is an interesting connection that hasn't been explored extensively in prior metamotivational research, which has instead focused on how metamotivational knowledge might improve performance on laboratory tasks or

course grades (Hubley et al., 2024; Nguyen et al., 2022; Ross et al., 2023). Perhaps accurate beliefs about progress framing may function more as a buffering mechanism against difficulties and distress during goal pursuit. This idea is particularly intriguing when considering that people might have slightly higher sensitivity to the differential benefits of to-date and to-go framing when commitment is weak and uncertain—an emotional state likely more distressing than strong commitment, and one that may benefit more from the appropriate progress framing strategy. I expand on this possibility in the general discussion.

That being said, given the modest and limited nature of these effects, this raises important questions about the practical application of metamotivational beliefs in everyday goal pursuit. While laboratory studies have demonstrated clear effects of progress framing on motivation (Koo & Fishbach, 2008), and the present research demonstrated that people have accurate metamotivational knowledge, the likelihood of this knowledge being translated into action during real-life goal pursuit appears to be more complex. As I discussed in Study 6, it seems likely that capturing the relationship between beliefs and outcomes may not be a straightforward process due to the complexity of when and in which contexts these beliefs might be most relevant—such as in the middle of goal pursuit (Bonezzi et al., 2011). It is also possible that accurate beliefs may be more beneficial for certain types of goals (e.g., long-term structured goals with clear progress markers) than others (e.g., vague or highly flexible goals). This could explain why effects were small and inconsistent—accurate beliefs may matter more for some goals but not others.

Several methodological limitations may also account for the limited findings. First, when asked to identify important personal strivings, participants are likely to choose goals to which they are already strongly committed, potentially creating ceiling effects that minimize the

relevance of progress framing strategies based on commitment level. Furthermore, the Day Reconstruction and Personal Strivings tasks relied on retrospective self-reports, which are susceptible to recall biases, and measured experiences at a single time point, which may not accurately capture the dynamic nature of motivation during goal pursuit (Bolger et al., 2003). Indeed, previous research by Ross et al. (2023) examining the link between regulatory focus metamotivational knowledge and performance suggests that there are many factors that might influence the likelihood that knowledge will get translated into performance—for instance, whether outcomes are being assessed in a short, single-shot context versus a more long-term context that provides multiple opportunities for people to employ metamotivational strategies and pursue their goals more effectively. Future research could begin to address some of these issues by employing methods that capture motivational processes in real-time across various contexts and commitment levels, such as experience sampling methods or daily diaries, as they have the potential to further tap into a more nuanced relationship between metamotivational beliefs and goal pursuit experiences.

In conclusion, Study 7 provided some evidence that metamotivational beliefs about progress framing relate to goal pursuit experiences, particularly perceptions of difficulty and distress. However, the overall pattern of results suggests that the impact of these beliefs on everyday and long-term goal engagement may be limited, or at least challenging to capture. Given the lack of evidence for a link between beliefs and goal progress in Study 6, this provides further evidence that while people's beliefs about progress framing may be relevant to motivation in some contexts, their influence on actual goal pursuit experiences may be weaker and/or more nuanced than initially expected. Further research is needed to determine when and

how these beliefs might translate into meaningful differences in motivation and goal achievement.

General Discussion

This dissertation addressed two primary research questions: (1) the nature and normative accuracy of people's metamotivational beliefs about to-date/to-go progress framing across various contexts, and (2) whether and when these beliefs manifest in or are related to behavioural and self-regulatory outcomes. I conducted seven studies using correlational, experimental, and longitudinal approaches to address these questions.

Studies 1 and 2 found that, on average, people demonstrated normatively accurate beliefs about to-date and to-go progress framing as a function of commitment using a hypothetical scenario assessment. Studies 3-5 explored beliefs through people's behavioural choices in different contexts. Study 3 found that people made differential progress framing choices as a function of their *own* level of commitment for their personal goals. However, Studies 4 and 5 did not find an effect of commitment on progress framing choices in the context of a lab-based anagram task or when making a choice for someone else's goal. Finally, Studies 6 and 7 investigated the relationship between beliefs and outcomes. Study 6 used a longitudinal design, finding no direct relationship between beliefs and goal progress or life satisfaction two weeks later. Study 7 employed a multimethod approach examining people's daily and longer-term goal pursuits, revealing that normatively accurate beliefs were associated with experiencing less distress and difficulty during goal pursuit, but not with other aspects such as increased goal progress or success.

Taken together, these studies demonstrate that people generally recognize the normative trade-offs associated with to-date and to-go progress framing, though there is substantial variability in the accuracy of these beliefs. There is some evidence that these beliefs manifest in behavioural choices, but the results were weaker and inconsistent. Finally, there was no clear

evidence that having knowledge in this domain predicts more goal success, though there was some evidence that it might help buffer against negative experiences during goal pursuit.

Theoretical Implications for Metamotivation

Metamotivation research thus far has focused primarily on beliefs about task-motivation fit (Fujita et al., 2024; Miele et al., 2020). For people to hold normatively accurate task-motivation fit beliefs, they must recognize the motivational demands of a given task (task knowledge; e.g., "I'll do better on this creativity task if I am in an eager state") and understand strategies that can upregulate or sustain an eager motivation (strategy knowledge; e.g., "I'll focus on what I can gain from this task"). The present work addresses a different (and common) motivational challenge: how can individuals increase motivation when they are relatively far from a reference point? Building on prior empirical work, I argued that one way people can do this effectively is by utilizing the reference point that best fits with their concerns of commitment or progress (Fishbach et al., 2009; Koo et al., 2021; Koo & Fishbach, 2008; Yu et al., 2022). That is, normatively accurate knowledge in this domain requires that people can recognize relevant signals about commitment concerns (e.g., "I'm uncertain about my commitment" or "That person is very committed") and understand whether a to-date versus to-go reference point will be more motivating given those concerns. Thus, effectiveness requires if-then knowledge of strategy effectiveness as a function of internal (versus external) signals. Consequently, this work also highlights the value of not simply understanding whether individuals have many versus few self-regulatory strategies, but understanding whether they recognize what strategies are most useful when.

Although metamotivational work in task-motivation fit has highlighted the role of self-knowledge (e.g., being able to assess one's motivational state) in contributing to normative

accuracy and effective implementation, the importance of monitoring and responding to internal motivational signals becomes even clearer in the current domain. In the context of progress framing, this can mean recognizing that motivation for a goal needs upregulation, recognizing one's own (or someone else's) level of commitment to that goal, and then understanding which progress framing strategy is most effective in that context. The present work provided evidence that people have some sensitivity to these signals, as communicated via scenarios in Studies 1, 2, 4, 6, and 7, and to their own levels of commitment in Study 3. However, there was substantial variability in these beliefs, and the discrepancy between the relatively strong evidence for normatively accurate beliefs using the scenario assessment compared to the relatively weaker and inconsistent evidence of knowledge through choice in Studies 3-5, as well as the limited evidence of a link between knowledge and outcomes in Studies 6 and 7, points to the possibility that people may struggle with this self-knowledge.

The challenge of metamotivational self-knowledge may be particularly relevant in the present domain as commitment is a complex, multifaceted construct that can fluctuate over time and across contexts (Burkley et al., 2013; Hollenbeck & Klein, 1987; Klein et al., 2014), potentially requiring ongoing introspection and monitoring (Miele & Scholer, 2018). But what is it exactly that people might be attending to when they try to assess their own commitment? Unlike external task demands that can be relatively straightforward to identify (e.g., "this is a creativity task"), commitment involves internal signals that may be more ambiguous and harder to decode. It is possible that people might rely on a variety of interoceptive and psychological cues to assess their commitment, such as noticing physiological responses like increased energy when thinking about the goal (Critchley & Garfinkel, 2017; Dunn et al., 2010), or noticing their own behavioural patterns such as how much time they spend thinking about or working towards

the goal (Bem, 1972; Laird, 2007). They might also attend to emotional signals, such as feelings of excitement versus dread when considering goal-related activities (Clore & Gasper, 2000), or cognitive indicators like how easily they can generate specific action plans or imagine achieving the goal (Gollwitzer, 1999; Taylor et al., 1998).

Notably, one's ability or tendency to detect or interpret these signals might vary depending on individual differences, such as interoceptive awareness (e.g., one's sensitivity to internal bodily signals; Garfinkel et al., 2014) or metacognitive awareness (e.g., confidence in one's own assessment of their commitment level; Fleming & Lau, 2014). Furthermore, the dynamic nature of commitment means that these internal signals may change throughout goal pursuit, requiring people to continually monitor and update their self-assessments (Carver & Scheier, 1998; Lord et al., 2010; Miele & Scholer, 2018). For instance, what feels like strong commitment at the beginning of goal pursuit may waver when obstacles arise. Conversely, initial uncertainty might strengthen into clearer commitment as people invest effort and see progress (Brehm & Self, 1989). More broadly, the complexity and ambiguity involved in detecting one's own commitment—whether at a single time-point or across the course of goal pursuit—may help explain why the scenario-based assessment, which explicitly provided clear and stable commitment information, showed stronger evidence of normatively accurate beliefs compared to Studies 3-5, which required participants to assess or work with more ambiguous commitment signals. Similarly, this challenge may contribute to the limited evidence of a link between knowledge and outcomes in Studies 6 and 7, as effective implementation of progress framing strategies in real-world goal pursuit would depend not only on having accurate metamotivational knowledge, but also on being able to reliably detect when one's commitment level calls for a particular strategy. Ultimately, there is much still to understand about how people monitor

internal motivational signals and use them to determine what motivational strategies to deploy when.

One unexpected finding was that, when people considered regulation in response to signals of strong (vs. weak) commitment, they were less likely to distinguish between to-date and to-go framings. Although speculative, it could be that people are less likely to recognize potential regulation challenges accompanying strong commitment, seeing the strength of this commitment itself as indicating likely goal success. In other words, people may see less need to regulate their motivation or to be strategic in their regulation when commitment is strong. This could mean that people may be especially likely to miss opportunities that could further bolster goal pursuit under these conditions, an interesting question for future research.

More fundamentally, this pattern suggests that people may have stronger intuitions about what to do when commitment is weak, perhaps because the psychological experience of wavering commitment is more salient or experienced as more pressing than the experience of strong commitment. When commitment is strong, people may be less concerned about optimizing their motivation, possibly because they believe strong commitment already serves as a sufficient motivational force (Locke & Latham, 1990). This potential asymmetry may help clarify the findings from Study 7, where more accurate metamotivational beliefs were associated with less goal interference from distress and lower perceptions of goal difficulty, but not with more goal progress or success (Studies 6 and 7). This pattern points to the possibility that progress framing knowledge may function as a protective factor against negative motivational experiences rather than as an enhancer of positive outcomes.

If this is the case, such a protective factor could be particularly valuable when commitment is fragile or uncertain, as these states are often characterized by greater

psychological vulnerability and distress (Brandtstädter & Rothermund, 2002; Klinger, 1975). This connects with broader research showing that people are more likely to engage in careful processing and seek regulatory strategies under conditions of uncertainty or threat (Chaiken et al., 1989; Petty & Cacioppo, 1986; Sherman & Cohen, 2006). Notably, if this asymmetry exists, it could have important implications for how we conceptualize and measure metamotivational knowledge in this domain—a methodological consideration I return to later in this discussion.

Contributions to Self-Regulation and Goal Pursuit

The present research on metamotivational beliefs about progress framing contributes to our understanding of how individuals monitor and control their goal pursuit, offering new insights that can be integrated with broader theories of self-regulation. For instance, traditional cybernetic models place an emphasis on discrepancy reductions—monitoring current states, comparing them against reference values, and implementing strategies to minimize the gap between current and desired end-states (Carver & Scheier, 1998). This framework typically involves a focus on the finish line, highlighting remaining progress as a motivational signal. While these models acknowledge discrepancy enhancement processes (i.e., a focus on one's distance from the starting line), it is typically in the context of avoidance goals rather than a frame that can be used more broadly.

As reviewed in the introduction, prior research has demonstrated that there are indeed important motivational implications of adopting these different reference points, depending on factors such as commitment level and distance from the reference points (Bonezzi et al., 2011; Koo & Fishbach, 2008). What has not been incorporated into cybernetic models, however, is the recognition that the choice between these reference points is itself an important self-regulatory decision, and that people's beliefs and knowledge about these framings are important to consider.

My research suggests that individuals do possess metamotivational knowledge about progress framing strategies in various contexts, recognizing when to focus on existing versus remaining progress based on their commitment level. This suggests that cybernetic models of self-regulation could be expanded to incorporate these strategic choice processes.

This knowledge may become especially critical during the "stuck in the middle" phase of goal pursuit, where both reference points are equidistant and motivation naturally sags (Bonezzi et al., 2011). This has important implications not only for single-goal contexts but also multiple goal contexts, where individuals must allocate limited resources across competing goals (Emmons & King, 1988; Riediger & Freund, 2004). The middle phase of goal pursuit represents a particularly vulnerable period for goal switching (Schmidt & DeShon, 2007), as individuals weigh whether continued investment in the current goal is worthwhile. The present research suggests that people may use progress framing strategies to help maintain motivation for important but challenging goals even when tempted by alternatives, pointing to the possibility that individuals might actively navigate both motivational dips and goal completion through strategic reference point selection. Future research could explore whether explicitly activating this knowledge (e.g., through targeted interventions) helps people resist the temptation to abandon goals during the middle phase in favour of new or more immediately rewarding goals.

Limitations and Future Directions

Commitment as a Signal

The current studies explored two facets of goal commitment strength (magnitude and certainty), and it will be important in future work to more fully distinguish these and understand their implications for motivation regulation. In the original theoretical framework (Koo & Fishbach, 2008), the researchers distinguished between commitment that is "certain and

relatively high" or "uncertain and relatively low." This distinction highlights two facets of commitment strength: commitment *certainty* and commitment *magnitude*. In the metamotivational assessment used in Study 1, the commitment strength manipulation also included information about both commitment certainty and commitment magnitude, though commitment certainty may have been the more salient signal. In other studies using Klein's commitment measure, such as in Study 3 which measured people's commitment strength to a current goal, the measure most directly assessed commitment magnitude, not certainty. I observed similar patterns in these studies, suggesting that people's beliefs about progress framings may be similar as a function of either facet. In addition, in Study 5 I found that the two constructs were highly correlated. Nonetheless, there may be cases in which the two diverge, or it could be that one of these signals is a better indicator of which progress framing is most effective. Future research should explicitly distinguish between commitment magnitude and certainty to determine their potentially independent effects on progress framing preferences.

Notably, commitment strength is one factor that influences whether to-date versus to-go information is most useful for increasing motivation (Koo & Fishbach, 2008), especially when people are at the midpoint of goal pursuit and thus susceptible to particularly low levels of motivation (Bonezzi et al., 2011). However, what makes regulating motivation via progress framings particularly complex is that there are other factors that can *also* determine when to-date and to-go framings are most effective, and these factors may not always point in the same direction.

For instance, for an individual who is near the end of goal pursuit, but also uncertain about their commitment, there are two viable (and competing) progress framings that could support increased motivation depending on the theoretical perspective one adopts. Work that

focuses on commitment strength might suggest that to-date information is better since the individual is uncertain about their commitment (Koo & Fishbach, 2008). However, research on discrepancy distance (Bonezzi et al., 2011) would suggest that to-go framing is beneficial because the individual is closer to the end-point. Depending on which factor is being attended to, or which is most salient, individuals may be more or less likely to be pulled towards a particular framing. Furthermore, the salience of a given signal may also affect which framing is actually most effective. Consequently, in the blooming, buzzing confusion of goal pursuit in the real world, it is not a simple matter to determine what progress framings are most useful, and normative accuracy must be understood in relation to a particular signal and set of features. Thus, understanding the dynamics that lead individuals to rely on particular signals, and the implications for the effectiveness of different progress framings, is an important direction for future research.

Assessing To-Date/To-Go Metamotivational Knowledge

The assessment of metamotivational beliefs about progress framing requires further methodological consideration. Throughout this dissertation, I have highlighted several factors that might be relevant for assessing beliefs in this domain, such as the operationalization of commitment, competing motivational signals, and the temporal context of goal pursuit in which these beliefs may be most relevant. However, there are additional methodological and conceptual factors that should be considered in future research.

The present work assesses people's metamotivational beliefs about to-date and to-go progress framing, with a focus on the normative accuracy of these beliefs—that is, whether people have an awareness of the differential effects observed in the literature. However, it is still unclear how metamotivational beliefs are developed and why some individuals form more

normatively accurate beliefs than others. While empirical research on this topic remains limited, Miele and colleagues (2020, 2024) have proposed several mechanisms through which metamotivational beliefs may develop, including observational learning from caregivers and role models, insights based on logical reasoning, and trial-and-error experimentation. Relatedly, research has yet to explore how knowledge of one's own past experiences (i.e., idiographic knowledge) might interact with normative knowledge, as well as the role it might play in linking beliefs to performance. For instance, people may believe a given progress framing strategy is more effective based on what has worked for them in the past, rather than what the research suggests would be most effective.

People may develop these beliefs in a number of ways, such as a particularly salient experience, or through personal experimentation in which a person repeatedly experiences success using a particular strategy to motivate themselves during goal pursuit. Indeed, participants' open-ended responses in Study 4 revealed that many acknowledged their general preferences or philosophies as justification for their choices (e.g., "my philosophy in life is to never look back"), suggesting that people may have individual differences in what they experience as more motivating. This raises the possibility that for a given situation, the optimal progress framing strategy based on the normative effects in the literature may conflict with what would actually be most motivating for a particular person (e.g., someone with weak commitment who also consistently experiences to-go framing as an effective motivator and views to-date framing as personally demotivating). These potential discrepancies and conflicts between normative and idiographic knowledge pose an interesting avenue for future research.

Relatedly, the theoretical possibility of asymmetric treatment effects discussed earlier has direct implications for assessing metamotivational knowledge. Although the literature

consistently demonstrates that to-date is motivating when commitment is weak and to-go is motivating when commitment is strong—and that using the opposite framing can actually be counterproductive (e.g., how to-date framing for a strong commitment goal can lead people to feel that sufficient progress has been made; Carver & Scheier, 1998; Locke & Latham, 1990; Miller et al., 1960)—these findings represent, and are assessed in the present research as, *relative* effects within each commitment level.

What remains unclear from existing research is whether these relative effects differ in magnitude or importance across commitment levels. As suggested by the patterns observed in this dissertation, it is possible that the motivational consequences of using appropriate versus inappropriate progress framings are more pronounced for weak commitment goals than strong commitment goals. To my knowledge, existing research has not systematically compared effect sizes across conditions to test for such asymmetries. If such a differential "dosage effect" relationship does exist, this should be taken into consideration when assessing the accuracy of people's metamotivational beliefs. For instance, one could develop weighted indices of metamotivational knowledge that reflect any relative differences in the importance of appropriate framing across commitment levels, with greater weight assigned to accuracy under conditions where such knowledge provides the most psychological benefit. Given that participants in the current studies appeared less sensitive to framing distinctions under strong commitment, reweighting their responses to account for the theoretical importance of each commitment level could potentially reveal that people do possess a highly nuanced understanding of when progress framing strategies matter most.

Another important consideration for assessing beliefs in this domain is goals without discrete endpoints. The theoretical framework and empirical research on to-date and to-go

progress framing has focused primarily on goals with clear completion points (e.g., completing a certain number of modules, raising a certain amount of money for charity). However, many real-world goals are ongoing or focused on maintenance (e.g., "being a good parent", "staying healthy"). Although Koo and Fishbach (2008) argued theoretically that progress framings should operate similarly for goals without discrete endpoints, this has not been systematically tested in the same way. Thus, the applicability of metamotivational knowledge about progress framing to such goals remains unclear, representing a potential boundary condition for both the effectiveness of these strategies and the assessment of people's beliefs about them.

Finally, it is important to observe that the participant samples all represented those from WEIRD (White, Educated, Industrialized, Rich, and Democratic) populations (Henrich et al., 2010). Future research may reveal that these findings do not generalize to other populations. Cultural differences in time orientation and goal pursuit could influence metamotivational beliefs about to-date and to-go progress framings. For instance, cultures with more cyclical time perspectives (Guo et al., 2012) or higher long-term orientation (Hofstede, 2001) might naturally prefer progress framing strategies other than those with a more linear perspective of time. Similarly, collectivist cultures that emphasize group achievement over individual accomplishments (Triandis, 1995) might develop different beliefs about which motivational framings are most effective for goal pursuit. Although cultural differences in goal commitment have been documented (Hofstede, 2001; Locke & Latham, 1990, 2002; Triandis, 1995), the impact on beliefs about progress framing is unexplored. Notably, in other research exploring people's metamotivational beliefs about other motivational constructs (e.g., regulatory focus, construal level), there is some evidence of cross-cultural generalizability (Nguyen et al., 2020,

2022). However, conclusions from the current studies should be limited to WEIRD populations until further research is conducted.

The Relationship between Beliefs and Outcomes

Studies 6 and 7 found limited evidence linking metamotivational knowledge to goal-related outcomes, which may reflect methodological challenges in capturing these relationships. Similar challenges have been noted in other metamotivation research, which argued that relationships between knowledge and outcomes can be difficult to detect (e.g., Miele & Scholer, 2018; Nguyen et al., 2022; Ross et al., 2023). While people demonstrated relatively accurate beliefs in hypothetical scenarios and in the context of choices for their personal goals, this knowledge did not translate into better goal outcomes, highlighting a potential gap between understanding progress framing strategies and successfully implementing them in real-world goal pursuit.

This gap likely reflects, at least in part, the distinction between possessing metamotivational knowledge and successfully implementing that knowledge in the complex, dynamic context of real-world goal pursuit. People may understand that to-date framing helps with weak commitment goals when making explicit choices about progress tracking methods, yet face significant challenges in recognizing commitment signals during ongoing goal pursuit, selecting the appropriate framing strategy in the moment, or implementing these strategies when competing demands are present. This aligns with broader research showing that metacognitive knowledge does not automatically translate into improved self-regulatory outcomes (Dunlosky & Rawson, 2012; Veenman et al., 2006).

There are many factors that might influence whether knowledge gets translated into behaviour and performance—for instance, whether people recognize real-life situations as

contexts where their metamotivational knowledge is relevant, or whether other competing factors are present. Further, as I have discussed throughout my dissertation, it appears that capturing the relationship between beliefs and outcomes may not be a straightforward process, in part due to the complexity of when and in which contexts these beliefs might be most relevant (e.g., in the middle of goal pursuit; Bonezzi et al., 2011).

The approaches used in the current studies may have also made it difficult to detect these relationships. The short time frames, reliance on self-reported outcomes, and inability to more tightly control for goal phase may have impeded my ability to detect potential effects. Further, these approaches may not be able to capture the complexity of real-world goal pursuit, where the benefits of metamotivational knowledge may emerge through subtle, ongoing processes rather than discrete, measurable outcomes. The Day Reconstruction Task in Study 7 represented a step toward a more naturalistic assessment, but still relied on retrospective reports rather than people's in-the-moment experiences. Future studies could employ more rigorous experience sampling methods to assess how progress framing beliefs operate in daily life (Bolger et al., 2003; Shiffman et al., 2008). Additional longitudinal designs would also better capture the dynamic nature of goal pursuit, allowing researchers to observe how beliefs influence goal experiences across different phases and contexts. Such designs could also investigate whether the implementation of metamotivational knowledge improves with practice or explicit training, addressing questions about the conditions under which beliefs successfully translate into beneficial outcomes. Finally, it may be worth further investigating whether metamotivational knowledge influences other aspects of goal pursuit beyond progress and success, such as the emotional experience of goal pursuit (e.g., reduced stress) or other protective outcomes similar to those identified in Study 7. This broader approach might reveal that metamotivational knowledge

operates more as a buffer against negative goal experiences rather than as an enhancer of positive outcomes—a distinction that could inform both theory and intervention efforts.

Conclusion

We are often told that if we keep our eyes on the prize, we will achieve our goals. Yet, the reality of effective goal pursuit is more nuanced than this conventional wisdom suggests. The current work demonstrates that people intuitively understand this nuance, recognizing that whether it helps to focus on the starting line or the finish line depends on how committed they are to their goals. This metamotivational knowledge represents a sophisticated understanding of the interplay between commitment and progress monitoring, two fundamental aspects of self-regulation. While translating this knowledge into improved goal outcomes remains complex, these findings reveal that people possess strategic insights about motivation regulation that extend far beyond simple platitudes about keeping one's eyes on the prize. Understanding when and how people deploy these insights opens new avenues for supporting effective goal pursuit and adds important depth to our understanding of how people navigate the challenges of staying motivated when it matters most.

References

Arkes, H. R., & Blumer, C. (1985). The psychology of sunk cost. *Organizational Behavior and Human Decision Processes, 35*(1), 124–140. https://doi.org/10.1016/0749-5978(85)90049-4

Ayduk, Ö., & Kross, E. (2010). From a distance: Implications of spontaneous self-distancing for adaptive self-reflection. *Journal of Personality and Social Psychology, 98*(5), 809–829. https://doi.org/10.1037/a0019205

Baek, T. H., & Yoon, S. (2020). Looking forward, looking back: The impact of goal progress and time urgency on consumer responses to mobile reward apps. *Journal of Retailing and Consumer Services*, *54*, 102046. https://doi.org/10.1016/j.jretconser.2020.102046

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, *4*(3), 359–373. https://doi.org/10.1521/jscp.1986.4.3.359

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*(2), 248–287. https://doi.org/10.1016/0749-5978(91)90022-L

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, *67*, 1–48. https://doi.org/10.18637/jss.v067.i01

Becker, D., & van der Pligt, J. (2016). Forcing your luck: Goal-striving behavior in chance situations. *Motivation and Emotion*, *40*(2), 203–211. https://doi.org/10.1007/s11031-015-9527-5

Bem, D. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). Academic Press.

Beshears, J., Dai, H., Milkman, K. L., & Benartzi, S. (2021). Using fresh starts to nudge increased retirement savings. *Organizational Behavior and Human Decision Processes*, *167*, 72–87. https://doi.org/10.1016/j.obhdp.2021.06.005

Bleidorn, W., Kandler, C., Riemann, R., Angleitner, A., & Spinath, F. M. (2012). Genetic and environmental influences on personality profile stability: Unraveling the normativeness problem. *Journal of Personality, 80*(4), 1029–1060. https://doi.org/10.1111/j.1467-6494.2011.00758.x

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology, 54*, 579–616. https://doi.org/10.1146/annurev.psych.54.101601.145030

Bonezzi, A., Brendl, C. M., & de Angelis, M. (2011). Stuck in the middle: The psychophysics of goal pursuit. *Psychological Science*, *22*(5), 607–612. https://doi.org/10.1177/0956797611404899

Boudreaux, M. J., & Ozer, D. J. (2013). Goal conflict, goal striving, and psychological well-being. *Motivation and Emotion, 37*(3), 433–443.

Brandtstädter, J., & Rothermund, K. (2002). The life-course dynamics of goal pursuit and goal adjustment: A two-process framework. *Motivation and Emotion, 26*(1), 15–31.

Brehm, J. W., & Self, E. A. (1989). The intensity of motivation. *Annual Review of Psychology, 40*, 109–131. https://doi.org/10.1146/annurev.ps.40.020189.000545

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet*, *395*(10227), 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822–848. https://doi.org/10.1037/0022-3514.84.4.822

Brysbaert, M., & Stevens, M. (2018). Power analysis and effect size in the context of mixed models. *Behavior Research Methods, 50*(3), 1223–1230.

Burkley, E., Anderson, D., Curtis, J., & Burkley, M. (2013). Vicissitudes of goal commitment: Satisfaction, investments, and alternatives. Personality and Individual Differences, 54(5), 663-668.

Burton, C. L., & Bonanno, G. A. (2016). Measuring ability to enhance positive and suppress negative emotion: The Emotion Regulation Inventory. *Psychological Assessment, 28*(8), 929–941. https://doi.org/10.1037/pas0000231

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. Cambridge University Press. https://doi.org/10.1017/CBO9781139174794

Carver, C. S., & White, T. L. (2013). Behavioral avoidance/inhibition (BIS/BAS) scales. Measurement Instrument Database for the Social Science. Retrieved from www.midss.ie

Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic information processing within and beyond the persuasion context. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 212–252). Guilford Press.

Chang, W., Chen, E., Mellers, B., & Tetlock, P. (2017). Developing expert political judgment: The impact of training and practice on judgmental accuracy in geopolitical forecasting tournaments. *Judgment and Decision Making, 12*(5), 472–490.

Chua, S. N., Philippe, F. L., & Bouizegarene, N. (2021). The association of autonomy support on memory need satisfaction and goal progress. *Motivation and Emotion, 45*(3), 265–279.

Clayton McClure, J. H., & Cole, S. N. (2022). Controllability is key: Goal pursuit during COVID-19 and insights for theories of self-regulation. *Journal of Applied Social Psychology*, *52*(12), 1196–1210. https://doi.org/10.1111/jasp.12920

Clore, G. L., & Gasper, K. (2000). Feeling is believing: Some affective influences on belief. In N. H. Frijda, A. S. R. Manstead, & S. Bem (Eds.), *Emotions and belief: How feelings influence thoughts* (pp. 10–44). Cambridge University Press.

Cooper, H., & Patall, E. A. (2009). The relative benefits of meta-analysis conducted with individual participant data versus aggregated data. *Psychological Methods*, *14*(2), 165–176. https://doi.org/10.1037/a0015565

Corr, P. J. (2008). Reinforcement Sensitivity Theory (RST): Introduction. In P. J. Corr (Ed.), *The reinforcement sensitivity theory of personality* (pp. 1–43). Cambridge University Press. https://doi.org/10.1017/CBO9780511819384.002

Critchley, H. D., & Garfinkel, S. N. (2017). Interoception and emotion. *Current Opinion in Psychology, 17,* 7–14. https://doi.org/10.1016/j.copsyc.2017.04.020

Cryder, C. E., Loewenstein, G., & Seltman, H. (2013). Goal gradient in helping behavior. *Journal of Experimental Social Psychology*, *49*(6), 1078–1083. https://doi.org/10.1016/j.jesp.2013.07.003

Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: The simultaneous analysis of multiple data sets. *Psychological Methods*, *14*(2), 81–100. https://doi.org/10.1037/a0015914

Dai, H., Milkman, K. L., & Riis, J. (2015). Put your imperfections behind you: Temporal landmarks spur goal initiation when they signal new beginnings. *Psychological Science*, *26*(12), 1927–1936. https://doi.org/10.1177/0956797615605818

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment, 18*(2), 192–203. https://doi.org/10.1037/1040-3590.18.2.192

Duckworth, A. L., & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (GRIT–S). *Journal of Personality Assessment, 91*(2), 166-174. https://doi.org/10.1080/00223890802634290

Dunbar, D., Proeve, M., & Roberts, R. (2018). Problematic Internet usage self-control dilemmas: The opposite effects of commitment and progress framing cues on perceived value of Internet, academic and social behaviors. *Computers in Human Behavior*, *82*, 16–33. https://doi.org/10.1016/j.chb.2017.12.039

Dunlosky, J., & Rawson, K. A. (2012). Overconfidence produces underachievement: Inaccurate self evaluations undermine students' learning and retention. *Learning and Instruction, 22*(4), 271–280. https://doi.org/10.1016/j.learninstruc.2011.08.003

Dunn, B. D., Galton, H. C., Morgan, R., Evans, D., Oliver, C., Meyer, M., Cusack, R., Lawrence, A. D., & Dalgleish, T. (2010). Listening to your heart: How interoception shapes emotion experience and intuitive decision making. *Psychological Science, 21*(12), 1835–1844. https://doi-org.proxy.lib.uwaterloo.ca/10.1177/0956797610389191

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*(2), 256–273. https://doi.org/10.1037/0033-295X.95.2.256

Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and Achievement Motivation* (pp. 75-146). W. H. Freeman.

Elliot, A. J., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology, 100*(3), 613–628. https://doi.org/10.1037/0022-0663.100.3.613

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology, 51*(5), 1058–1068. https://doi.org/10.1037/0022-3514.51.5.1058

Emmons, R. A., & King, L. A. (1988). Conflict among personal strivings: Immediate and long-term implications for psychological and physical well-being. *Journal of Personality and Social Psychology, 54*(6), 1040–1048. https://doi.org/10.1037/0022-3514.54.6.1040

Fabrigar, L. R., & Wegener, D. T. (2016). Conceptualizing and evaluating the replication of research results. *Journal of Experimental Social Psychology*, *66*, 68–80. https://doi.org/10.1016/J.JESP.2015.07.009

Feather, N. T. (1982). *Expectations and actions: Expectancy-value models in psychology*. Erlbaum.

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.

Finkelstein, S. R., & Fishbach, A. (2012). Tell me what I did wrong: Experts seek and respond to negative feedback. *Journal of Consumer Research*, *39*(1), 22–38. https://doi.org/10.1086/661934

Finkelstein, S. R., Fishbach, A., & Tu, Y. (2017). When friends exchange negative feedback. *Motivation and Emotion*, *41*(1), 69–83. https://doi.org/10.1007/s11031-016-9589-z

Fishbach, A. (2021). Society for the Science of Motivation Presidential Address: Can we harness motivation science to motivate ourselves? *Motivation Science, 7*(4), 363–374. https://doi.org/10.1037/mot0000243

Fishbach, A. (2022). *Get it done: Surprising lessons from the science of motivation*. Pan Macmillan UK.

Fishbach, A., & Dhar, R. (2005). Goals as excuses or guides: The liberating effect of perceived goal progress on choice. *Journal of Consumer Research*, *32*(3), 370–377. https://doi.org/10.1086/497548

Fishbach, A., Dhar, R., & Zhang, Y. (2006). Subgoals as substitutes or complements: The role of goal accessibility. *Journal of Personality and Social Psychology*, *91*(2), 232–242. https://doi.org/10.1037/0022-3514.91.2.232

Fishbach, A., Eyal, T., & Finkelstein, S. R. (2010). How positive and negative feedback motivate goal pursuit. *Social and Personality Psychology Compass, 4*(8), 517–530. https://doi.org/10.1111/j.1751-9004.2010.00285.x

Fishbach, A., Friedman, R. S., & Kruglanski, A. W. (2003). Leading us not into temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology, 84*(2), 296–309. https://doi.org/10.1037/0022-3514.84.2.296

Fishbach, A., Henderson, M. D., & Koo, M. (2011). Pursuing goals with others: Group identification and motivation resulting from things done versus things left undone. *Journal of Experimental Psychology: General, 140*(3), 520–534. https://doi.org/10.1037/a0023907

Fishbach, A., Koo, M., & Finkelstein, S. R. (2014). Motivation resulting from completed and missing actions. In J. Olson & M. P. Zanna (Eds.), *Advances in experimental social*

psychology (Vol. 50, pp. 257–307). Elsevier. https://doi.org/10.1016/B978-0-12-800284-1.00005-9

Fishbach, A., Shah, J. Y., & Kruglanski, A. W. (2004). Substituting and complementing instrumentalities in goal systems. *Journal of Personality and Social Psychology, 87*(5), 559–572.

Fishbach, A., & Zhang, Y. (2008). Together or apart: When goals and temptations complement versus compete. *Journal of Personality and Social Psychology*, *94*(4), 547–559. https://doi.org/10.1037/0022-3514.94.4.547

Fishbach, A., & Zhang, Y. (2008). Together or apart: When goals and temptations complement versus compete. *Journal of Personality and Social Psychology, 94*(4), 547–559. https://doi.org/10.1037/0022-3514.94.4.547

Fishbach, A., Zhang, Y., & Koo, M. (2009). The dynamics of self-regulation. *European Review of Social Psychology*, *20*(1), 315–344. https://doi.org/10.1080/10463280903275375

Fishbein, M., & Ajzen, I. (1974). Attitudes towards objects as predictors of single and multiple behavioral criteria. *Psychological Review*, *81*(1), 59–74. https://doi.org/10.1037/h0035872

Fleming, S. M., & Lau, H. C. (2014). How to measure metacognition. *Frontiers in Human Neuroscience, 8,* Article 443. https://doi.org/10.3389/fnhum.2014.00443

Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: Regulatory focus and the "goal looms larger" effect. *Journal of Personality and Social Psychology*, *75*(5), 1115–1131. https://doi.org/10.1037/0022-3514.75.5.1115

Fujita, K., Le, P. Q., Scholer, A. A., & Miele, D. B. (2024). The metamotivation approach: Insights into the regulation of motivation and beyond. *Social and Personality Psychology Compass*, *18*(2), e12937. https://doi.org/10.1111/spc3.12937

Fulford, D., Johnson, S. L., Llabre, M. M., & Carver, C. S. (2010). Pushing and coasting in dynamic goal pursuit: Coasting is attenuated in bipolar disorder. *Psychological Science, 21*(7), 1021–1027. https://doi.org/10.1177/0956797610373372

Garfinkel, S. N., Critchley, H. D., & Seth, A. K. (2015). The interoceptive mind: From homeostasis to awareness. *Trends in Cognitive Sciences, 19*(11), 560–571.

Goh, J. X., Hall, J. A., & Rosenthal, R. (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how. *Social and Personality Psychology Compass*, *10*(10), 535–549. https://doi.org/10.1111/spc3.12267

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*(7), 493–503. https://doi.org/10.1037/0003-066X.54.7.493

Green, P., & MacLeod, C. J. (2016). Mindfulness training improves task performance and cognitive control: Evidence from a randomized controlled trial. *Consciousness and Cognition, 45*, 109–117.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Guo, T., Ji, L. J., Spina, R., & Zhang, Z. (2012). Culture, temporal focus, and values of the past and the future. *Personality and Social Psychology Bulletin, 38*(8), 1030–1040.

Heath, C., Larrick, R. P., & Wu, G. (1999). Goals as reference points. *Cognitive Psychology*, *38*(1), 79–109. https://doi.org/10.1006/cogp.1998.0708

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature, 466*, 29. http://dx.doi.org/10.1038/466029a

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319–340. https://doi.org/10.1037/0033-295X.94.3.319

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). The Guilford Press.

Higgins, E. T. (1997). Beyond pleasure and pain. *Am. Psychol.* 52, 1280–1300. https://doi.org/10.1037/0003-066X.52.12.1280

Higgins, E. T. (2006). Value from hedonic experience and engagement. *Psychological Review, 113*(3), 439–460. https://doi.org/10.1037/0033-295X.113.3.439

Higgins, E. T., Friedman, R. S., Harlow, R. E., Idson, L. C., Ayduk, O. N., & Taylor, A. (2001). Achievement orientations from subjective histories of success: Promotion pride versus prevention pride. *European Journal of Social Psychology, 31*, 3–23. http://dx.doi.org/10.1002/ejsp.27

Higgins, E. T., & Rholes, W. S. (1978). "Saying is believing": Effects of message modification on memory and liking for the person described. *Journal of Experimental Social Psychology, 14*(4), 363–378. https://doi.org/10.1016/0022-1031(78)90032-X

Higgins, E. T., & Scholer, A. A. (2009). Engaging the consumer: The science and art of the value creation process. *Journal of Consumer Psychology*, *19*(2), 100-114.

Hofer, G., Langmann, L., Burkart, R., & Neubauer, A. C. (2022). Who knows what we are good at? Unique insights of the self, knowledgeable informants, and strangers into a person's

abilities. *Journal of Research in Personality*, *98*, 104226. https://doi.org/10.1016/j.jrp.2022.104226

Hofstede, G. (2001). Culture's consequences: Comparing values, behaviors, institutions and organizations across nations (2nd ed.). Sage Publications.

Hollenbeck, J. R., & Klein, H. J. (1987). Goal commitment and the goal-setting process: Problems, prospects, and proposals for future research. *Journal of Applied Psychology, 72*(2), 212–220. https://10.1037/0021-9010.72.2.212

Hollenbeck, J. R., Williams, C. R., & Klein, H. J. (1989). An empirical examination of the antecedents of commitment to difficult goals. *Journal of Applied Psychology, 74,* 18–23.

Hubley, C., Edwards, J., Miele, D. B., & Scholer, A. A. (2024). Metamotivational beliefs about intrinsic and extrinsic motivation. *Journal of Personality and Social Psychology*, *126*(1), 26–57. https://doi.org/10.1037/pspa0000362

Hull, C. L. (1932). The goal-gradient hypothesis and maze learning. *Psychological Review, 39*(1), 25–43. https://doi.org/10.1037/h0072640

James, S. A., Hartnett, S. A., & Kalsbeek, W. D. (1983). John Henryism and blood pressure differences among Black men. *Journal of Behavioral Medicine, 6*(3), 259–278. https://doi.org/10.1007/BF01315113

Janis, I. L., & King, B. T. (1954). The influence of role playing on opinion change. *Journal of Abnormal and Social Psychology, 49*(2), 211–218. https://doi.org/10.1037/h0056957

Jansen, E. J., Miele, D. B., Fujita, K., & Scholer, A. A. (2022). Managing the motivation of others: Do managers recognize how to manage regulatory focus in subordinates? *Motivation Science*, *8*(4), 330–345. https://doi.org/10.1037/mot0000273

Johnson, R. E., Chang, C. H., & Lord, R. G. (2006). Moving from cognition to behavior: What the research says. *Psychological Bulletin, 132*(3), 381–415. https://doi.org/10.1037/0033-2909.132.3.381

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science, 306*(5702), 1776–1780. https://doi.org/10.1126/science.1103572

Kashdan, T. B., Disabato, D. J., Goodman, F. R., Doorley, J. D., & McKnight, P. E. (2020). The five-dimensional curiosity scale: Capturing the bandwidth of curiosity and identifying four unique subgroups of curious people. *Journal of Research in Personality, 85*, 103933.

Kiesler, C. A. (1971). *The psychology of commitment: Experiments linking behavior to belief*. Academic Press.

Kivetz, R., Urminsky, O., & Zheng, Y. (2006). The goal-gradient hypothesis resurrected: Purchase acceleration, illusionary goal progress, and customer retention. *Journal of Marketing Research, 43*(1), 39–58. https://doi.org/10.1509/jmkr.43.1.39

Klein, H. J., Cooper, J. T., Molloy, J. C., & Swanson, J. A. (2014). The assessment of commitment: Advantages of a unidimensional, target-free approach. *Journal of Applied Psychology*, *99*(2), 222–238. https://doi.org/10.1037/a0034751

Klinger, E. (1975). Consequences of commitment to and disengagement from incentives. *Psychological Review, 82*(1), 1–25. https://doi.org/10.1037/h0076171

Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality, 76*(5), 1201–1230. https://doi.org/10.1111/j.1467-6494.2008.00519.x

Koestner, R., Powers, T. A., Carbonneau, N., Milyavskaya, M., & Chua, S. N. (2012). Distinguishing autonomous and directive forms of goal support: Their effects on goal progress, relationship quality, and subjective well-being. *Personality and Social Psychology Bulletin, 38*(12), 1609–1620. https://doi.org/10.1177/0146167212457075

Koo, M., & Fishbach, A. (2008). Dynamics of self-regulation: How (un)accomplished goal actions affect motivation. *Journal of Personality and Social Psychology*, *94*(2), 183–195. https://doi.org/10.1037/0022-3514.94.2.183

Koo, M., Fishbach, A., & Park, H. K. (2021). What to say to round up more donors, or bigger donations. *Motivation Science*, *7*(3), 291–305. https://doi.org/10.1037/mot0000228

Laird, J. D. (2007). Feelings: The perception of self. *Oxford University Press*.

Lee, H. (2016). Which feedback is more effective for pursuing multiple goals of differing importance? The interaction effects of goal importance and performance feedback type on self-regulation and task achievement. *Educational Psychology*, *36*(2), 297–322. https://doi.org/10.1080/01443410.2014.995596

Liberman, N., & Förster, J. (2008). Expectancy, value and psychological distance: A new look at goal gradients. *Social Cognition*, *26*(5), 515–533. https://doi.org/10.1521/soco.2008.26.5.515

Lichtenstein, S., & Slovic, P. (1971). Reversals of preference between bids and choices in gambling decisions. *Journal of Experimental Psychology*, *89*(1), 46–55. https://doi.org/10.1037/h0031207

Lichtenstein, S., & Slovic, P. (1971). Reversals of preference between bids and choices in gambling decisions. *Journal of Experimental Psychology, 89*(1), 46–55. https://doi.org/10.1037/h0031207

Litman, L., Robinson, J., & Abberbock, T. (2017). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods, 49*(2), 433–442. https://doi.org/10.3758/s13428-016-0727-z

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*. Prentice-Hall, Inc.

Locke, E. A., Latham, G. P. & Erez, M. (1988). The determinants of goal commitment. *Academy of Management Review, 13*, 23–39.

Lord, R. G., Diefendorff, J. M., Schmidt, A. M., & Hall, R. J. (2010). Self-regulation at work. *Annual Review of Psychology, 61*, 543–568. https://doi.org/10.1146/annurev.psych.093008.100314

MacCann, C., Duckworth, A. L., & Roberts, R. D. (2009). Empirical identification of the major facets of conscientiousness. *Learning and Individual Differences, 19*(4), 451–458. https://doi.org/10.1016/j.lindif.2009.03.007

MacGregor, K. E., Carnevale, J. J., Dusthimer, N. E., & Fujita, K. (2017). Knowledge of the self-control benefits of high-level versus low-level construal. *Journal of Personality and Social Psychology*, *112*(4), 607–620. https://doi.org/10.1037/pspp0000130

Markman, A. B., & Brendl, C. M. (2000). The influence of goals on value and choice. In D. L. Medin (Ed.), *Psychology of learning and motivation* (Vol. 39, pp. 97–128). Academic Press.

McCrae, R. R., & Costa, P. T. (1994). The stability of personality: Observations and evaluations. *Current Directions in Psychological Science, 3*(6), 173–175. https://doi.org/10.1111/1467-8721.ep10770693

Miele, D. B., Fujita, K., & Scholer, A. A. (2024). The role of metamotivational knowledge in the regulation of motivation. *Motivation Science, 10*(3), 197–209. https://doi.org/10.1037/mot0000336

Miele, D. B., & Scholer, A. A. (2018). The role of metamotivational monitoring in motivation regulation. *Educational Psychologist*, *53*(1), 1–21. https://doi.org/10.1080/00461520.2017.1371601

Miele, D. B., Scholer, A. A., & Fujita, K. (2020). Metamotivation: Emerging research on the regulation of motivational states. *Advances in Motivation Science*, *7*, 1–42. https://doi.org/10.1016/bs.adms.2019.10.001

Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the structure of behavior*. Henry Holt and Co. https://doi.org/10.1037/10039-000

Monzani, D., Steca, P., Greco, A., D'Addario, M., Pancani, L., & Cappelletti, E. (2015). Effective pursuit of personal goals: The fostering effect of dispositional optimism on goal commitment and goal progress. *Personality and Individual Differences*, *82*, 203–214. https://doi.org/10.1016/j.paid.2015.03.019

Murayama, K., Kitagami, S., Tanaka, A., & Raw, J. A. (2016). People's naiveté about how extrinsic rewards influence intrinsic motivation. *Motivation Science, 2*(3), 138–142. https://doi.org/10.1037/mot0000040

Neubauer, A. B., & Hofer, M. (2022). Self-control in daily life: A review of experience sampling studies on its antecedents and consequences. *European Psychologist, 27*(1), 1–14.

Nguyen, T., Carnevale, J. J., Scholer, A. A., Miele, D. B., & Fujita, K. (2019). Metamotivational knowledge of the role of high-level and low-level construal in goal-relevant task

performance. *Journal of Personality and Social Psychology, 117*(5), 876–899. http://dx.doi.org/10.1037/pspa0000166

Nguyen, T., Scholer, A. A., Miele, D. B., Edwards, M. C., & Fujita, K. (2022). Predicting academic performance with an assessment of students' knowledge of the benefits of high-level and low-level construal. *Social Psychological and Personality Science, 14*(2), 195–206. https://doi.org/10.1177/19485506221090051

Nguyen, T., Togawa, T., Scholer, A. A., & Fujita, K. (2020). A cross-cultural investigation of metamotivational knowledge of construal level in the United States and Japan. *Motivation Science*, *6*(4), 386–400. https://doi.org/10.1037/mot0000178

Oettingen, G., Mayer, D., Sevincer, A. T., Stephens, E. J., Pak, H.-j., & Hagenah, M. (2009). Mental contrasting and goal commitment: The mediating role of energization. *Personality and Social Psychology Bulletin, 35*(5), 608–622.

Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology, 45*(4), 867–872. https://doi.org/10.1016/j.jesp.2009.03.009

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. Springer-Verlag.

Petty, R. E., & Krosnick, J. A. (1995). *Attitude strength: Antecedents and consequences*. Lawrence Erlbaum Associates, Inc.

Powers, W. T. (1973). *Behavior: The control of perception*. Aldine.

Reber, A. S. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General, 118*(3), 219–235. https://doi.org/10.1037/0096-3445.118.3.219

Riediger, M., & Freund, A. M. (2004). Interference and facilitation among personal goals: Differential associations with subjective well-being and persistent goal pursuit. *Personality and Social Psychology Bulletin, 30*(12), 1511–1523. https://doi.org/10.1177/0146167204271184

Ritchie, L., Cervone, D., & Sharpe, B. T. (2021). Goals and self-efficacy beliefs during the initial COVID-19 lockdown: A mixed methods analysis. *Frontiers in Psychology*, *11*. https://www.frontiersin.org/articles/10.3389/fpsyg.2020.559114

Ross, J., Nguyen, T., Fujita, K., Miele, D. B., Scholer, A. A., & Edwards, M. C. (2023). The relationship between metamotivational knowledge and performance. *Frontiers in Psychology*, *14*. https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1124171

Ross, J., Nguyen, T., Fujita, K., Miele, D. B., Scholer, A. A., & Edwards, M. C. (2023). The relationship between metamotivational knowledge and performance. *Frontiers in Psychology*, *14*. https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1124171

Schmidt, A. M., & DeShon, R. P. (2007). What to do? The effects of discrepancies, incentives, and time on dynamic goal prioritization. *Journal of Applied Psychology, 92*(4), 928–941. https://doi.org/10.1037/0021-9010.92.4.928

Scholer, A. A., & Miele, D. B. (2016). The role of metamotivation in creating task-motivation fit. *Motivation Science*, *2*(3), 171–197. https://doi.org/10.1037/mot0000043

Scholer, A. A., Miele, D. B., Murayama, K., & Fujita, K. (2018). New directions in self-regulation: The role of metamotivational beliefs. *Current Directions in Psychological Science*, *22*(5), 413–417. https://doi.org/10.1177/0963721413484467

Schwinger, M., & Stiensmeier-Pelster, J. (2012). Effects of motivational regulation on effort and achievement: A mediation model. *International Journal of Educational Research*, *56*, 35–47. https://doi.org/10.1016/j.ijer.2012.07.005

Segerstrom, S. C., & Solberg Nes, L. (2006). When goals conflict but people prosper: The case of dispositional optimism. *Journal of Research in Personality*, *40*(5), 675–693. https://doi.org/10.1016/j.jrp.2005.08.001

Seibert, S. E., Crant, J. M., & Kraimer, M. L. (1999). Proactive personality and career success. *The Journal of Applied Psychology*, *84*(3), 416–427. https://doi.org/10.1037/0021-9010.84.3.416

Shah, J. Y., Friedman, R., & Kruglanski, A. W. (2002). Forgetting all else: On the antecedents and consequences of goal shielding. *Journal of Personality and Social Psychology, 83*(6), 1261–1280. https://doi.org/10.1037/0022-3514.83.6.1261

Sheldon, K. M., & Kasser, T. (1998). Pursuing personal goals: Skills enable progress, but not all progress is beneficial. *Personality and Social Psychology Bulletin, 24,* 1319–1331.

Sherman, D. K., & Cohen, G. L. (2006). The psychology of self-defense: Self-affirmation theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology,* Vol. 38, (pp. 183–242). Elsevier Academic Press. https://doi.org/10.1016/S0065-2601(06)38004-5

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology, 4*, 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of*

Personality and Social Psychology, 60(4), 570–585. https://doi.org/10.1037/0022-3514.60.4.570

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*(2), 271–324. https://doi.org/10.1111/j.0022-3506.2004.00263.x

Taylor, S. E., Pham, L. B., Rivkin, I. D., & Armor, D. A. (1998). Harnessing the imagination: Mental simulation, self-regulation, and coping. *American Psychologist, 53*(4), 429–439. https://doi.org/10.1037/0003-066X.53.4.429

Thürmer, J. L., Scheier, M. F., & Carver, C. S. (2020). On the mechanics of goal striving: Experimental evidence of coasting and shifting. *Motivation Science*, *6*(3), 266–274. https://doi.org/10.1037/mot0000157

Touré-Tillery, M., & Fishbach, A. (2011). The course of motivation. *Journal of Consumer Psychology*, *21*(4), 414–423. https://doi.org/10.1016/j.jcps.2011.04.004

Triandis, H. C. (1995). *Individualism & collectivism.* Westview Press.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, *211*(4481), 453–458.

Vancouver, J. B., Weinhardt, J. M., & Schmidt, A. M. (2010). A formal, computational theory of multiple-goal pursuit: Integrating goal-choice and goal-striving processes. *Journal of Applied Psychology, 95*(6), 985–1008.

Vazire, S. (2010). Who knows what about a person? The self–other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology*, *98*(2), 281–300. https://doi.org/10.1037/a0017908

Veenman, M. V. J., Van Hout-Wolters, B. H. A. M., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and Learning, 1*(1), 3–14. https://doi.org/10.1007/s11409-006-6893-0

Vroom, V. H. (1964). *Work and motivation*. Wiley.

Wagner, R. K. (1987). Tacit knowledge in everyday intelligent behavior. *Journal of Personality and Social Psychology, 52*(6), 1236–1247.

Wagner, R. K., & Sternberg, R. J. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. *Journal of Personality and Social Psychology*, *49*(2), 436-458.

Wallace, S. G., & Etkin, J. (2018). How goal specificity shapes motivation: A reference points perspective. *Journal of Consumer Research*, *44*(5), 1033–1051. https://doi.org/10.1093/jcr/ucx082

Wolters, C. A. (2003). Regulation of motivation:evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, *38*(4), 189–205. https://doi.org/10.1207/S15326985EP3804

Wolters, C. A. (2011). Regulation of motivation: Contextual and social aspects. *Teachers College Record*, *113*(2), 265–283. https://doi.org/10.1177/016146811111300202

Wolters, C. A., & Benzon, M. B. (2013). Assessing and predicting college students' use of strategies for the self-regulation of motivation. *Journal of Experimental Education*, *81*(2), 199–221. https://doi.org/10.1080/00220973.2012.699901

Woolley, K., & Fishbach, A. (2015). The experience matters more than you think: People value intrinsic incentives more inside than outside an activity. *Journal of Personality and Social Psychology*, *109*(6), 968–982. https://doi.org/10.1037/pspa0000035

Yu, I. Y., Liu, C., Yang, M. X., & Zeng, K. J. (2022). Looking-forward or looking-back: Feedback strategies in tier-based hotel loyalty programs. *International Journal of Hospitality Management*, *102*, 103164. https://doi.org/10.1016/j.ijhm.2022.103164

Zell, E., & Krizan, Z. (2014). Do people have insight into their abilities? A metasynthesis. *Perspectives on Psychological Science*, *9*(2), 111–125. https://doi.org/10.1177/1745691613518075

Appendix A

Appendix A provides copies of preregistered analysis plans for Studies 3a, 3b, and 5. These were originally posted on the Open Science Framework. Study 2b was preregistered through the preregistration portal on the Open Science Framework (OSF) and is available at https://osf.io/kzf8j/?view_only=e6420445473543ed9174efd6502e0f0e

Appendix A1: Study 3c Analysis Plan

1. **Background**
    a. Previous research has demonstrated that whether it helps to focus on the starting line or the finish line depends on how committed people are to their goals (Koo & Fishbach, 2008). More specifically, if a person is highly committed to a goal, thinking about how much they have left to accomplish – "to-go" information – is more motivating, whereas if a person's commitment level is low or uncertain, thinking about what has already been accomplished – "to-date" information – is more motivating. Our prior work reveals that, on average**,** people have accurate normative knowledge in this domain. Building on a pilot study conducted in Winter 2021, the present study aims to extend this research by examining whether people demonstrate accurate metamotivational knowledge in this domain when making a consequential choice related to one of their own real-world goals. Participants will be instructed to list several short-term goals that they are currently pursuing and will be assigned one of these goals as their focal goal for this study. Their commitment to their focal will be measured. Participants will choose a worksheet, ostensibly to track their progress on their focal goal over time, which emphasizes either to-date or to-go progress.
2. **Design Plan**
    a. Study Type
        i. Correlational
    b. Blinding
        i. N/A
    c. Study Procedure
        i. Participants will be told that the study explores how people think about their short-term goals. They will be asked to list six short-term, discrete goals that they are currently pursuing, will randomly assigned one of the six goals to focus on. Participants will make a consequential choice between two goal progress tracking worksheets, each of which emphasizes either to-date or to-go progress. They will also complete personality measures (optimism and self-monitoring, for exploratory purposes). All participants will also provide basic demographic information.
3. **Variables**
    a. Independent Variable(s)

i. Goal commitment: measured using Klein et al.'s (2014) unidimensional target-free measure of commitment

b. Dependent Variable(s)
   i. Consequential choice: participants will make a consequential choice between to-date and to-go goal progress framing by choosing one of two goal progress tracking worksheets. Worksheet A emphasizes to-date progress, and Worksheet B emphasizes to-go progress.
   ii. Continuous ratings: participants will provide ratings of how motivating they think each worksheet (A and B) would be for tracking their progress on their focal goal by responding to 8 items (4 per worksheet). A composite score will be computed for each worksheet.

c. Exploratory Variable(s)
   i. Goal Progress: participants will report their current level of progress on their focal goal using a sliding scale, from 0-100 percent.
   ii. Optimism: measured using the Life Orientation Test – Revised (Scheier et al., 1994).
   iii. Self-monitoring: measured using the Revised Self-Monitoring Scale (Lennox & Wolfe, 1984).

4. Sampling Plan

a. Participants/Sample Description
   i. Undergraduate psychology students at a large Canadian university.

b. Data Collection Procedures
   i. Participants will be recruited through the psychology department's participant management system and will receive 0.5 participation credits for 30 minutes of participation. Data will be collected online, using a survey administered through Qualtrics.
   ii. Data collection will begin on June 3, 2021 and will continue until the target sample size is reached.

c. Projected Sample Size
   i. $N = 200$

d. Sample Size Rationale
   i. To determine an estimated sample size, we conducted an a priori power analysis in G*Power version 3.1.9.7. The analysis showed that a sample size of 188 will provide 99% power to detect an effect size of $\rho = .30$ (based on prior work) at the standard .05 alpha error probability for our primary analysis (i.e., point biserial correlation; two-tailed). To account for potential exclusions, we aim to recruit at least 200.

e. Stopping Rule
   i. Data collection will stop once we reach our target N ($N = 200$)

5. Exclusion Criteria

a. Participants are asked to answer "*How distracted were you during the study*" and "*How seriously did you take the study*" on a scale from 1 (*not at all*) to 5 (*extremely*). Anyone who reports 4-5 for distracted or 1-2 for seriousness will be excluded from analyses.

6. Analysis Plan

a. Outliers

i. Univariate outliers with scores > 3 *SD*s from the mean will be winsorized to ± 3 *SD*s to minimize their influence on results (Tabachnik & Fidell, 2007). Where numerous cases (> 2%) or very extreme values (> 4 *SD*s) have been winsorized, analyses will be performed with and without winsorization.

b. Missing Data
   i. Generally, we will handle missing data by pairwise—not listwise—exclusion (i.e., participants missing data for specific variables will be excluded from analyses involving those variables but may be included in models using other variables).
   ii. For missing items within larger composite scales, the measures will be computed by averaging across the items where data is present.

c. Variable/Composite Creation
   i. Commitment: a composite score will be created by averaging each participant's responses to all items of the commitment measure. This will yield a score from 1-7, with higher scores indicating higher commitment.
   ii. Consequential choice: participant choices will be coded as 0 = to-date and 1 = to-go.
   iii. Continuous ratings of worksheets: a composite score for each worksheet/framing option (Worksheet A = to-date, Worksheet B = to-go) will be created by averaging each participants' responses to the 4 items about each worksheet.
   iv. Goal progress: participants will report their current level of progress on their focal goal using a sliding scale, from 0-100 percent.
   v. Optimism: after reverse-scoring as required (items 3, 7, and 9), a composite score will be created by averaging each participant's responses to items 1, 3, 4, 7, 9, and 10 of the LOT-R (items 2, 5, 6, and 8 are filler items and are thus omitted from the composite score). This will yield a score from 1-5, with higher scores indicating greater optimism.
   vi. Self-monitoring: after reverse-scoring as required (items 9 and 12), a composite score will be created by averaging each participant's responses to all items of the Revised Self-Monitoring Scale. This will yield a score from 1-6, with higher scores indicating greater self-monitoring.
   vii. Binary choices: choices will be coded as 0 = to-date and 1 = to-go.

d. Statistical Models
   i. Descriptive Statistics: means, medians, standard deviations, skewness, kurtosis, etc. will be computed for every variable.
   ii. Point-biserial correlation: to determine if goal commitment predicts choice of to-date or to-go progress framing, a point-biserial correlation will be conducted. This analysis will examine the association between commitment (a continuous variable) and progress framing choice (to-date or to-go). A significant positive correlation between commitment level and to-go choice would indicate that participants demonstrate accurate metamotivational knowledge.
   iii. Bivariate correlation: to examine participants' continuous ratings of how motivating to-date and to-go framing would be at varying levels of commitment, I will conduct a bivariate correlation analysis examining the

association between commitment level and continuous ratings of motivation for each type of progress framing (to-date and to-go). If participants demonstrate accurate metamotivational knowledge, this analysis should show a significant positive correlation between commitment level and to-go ratings, and a significant negative correlation between commitment level and to-date ratings.

Appendix A2: Study 3d Analysis Plan

1. **Background**
    a. Previous research has demonstrated that whether it helps to focus on the starting line or the finish line depends on how committed people are to their goals (Koo & Fishbach, 2008). More specifically, if a person is highly committed to a goal, thinking about how much they have left to accomplish – "to-go" information – is more motivating, whereas if a person's commitment level is low or uncertain, thinking about what has already been accomplished – "to-date" information – is more motivating. Our prior work reveals that, on average**,** people have accurate normative knowledge in this domain. Building on a pilot study conducted in Winter 2021, the present study aims to extend this research by examining whether people demonstrate accurate metamotivational knowledge in this domain when making a consequential choice related to one of their own real-world goals. It will also explore whether optimism moderates this effect. Participants will be instructed to list several short-term goals that they are currently pursuing and will be assigned one of these goals as their focal goal for this study. Their commitment to their focal will be measured. Participants will choose a worksheet, ostensibly to track their progress on their focal goal over time, which emphasizes either to-date or to-go progress.
2. **Design Plan**
    a. Study Type
        i. Correlational
    b. Blinding
        i. N/A
    c. Study Procedure
        i. Participants will be told that the study explores how people think about their short-term goals. They will be asked to list six short-term, discrete goals that they are currently pursuing, will randomly assigned one of the six goals to focus on. Participants will make a consequential choice between two goal progress tracking worksheets, each of which emphasizes either to-date or to-go progress. They will also complete a measure of optimism, along with basic demographic information.
3. **Variables**
    a. Independent Variable(s)
        i. Goal commitment: measured using Klein et al.'s (2014) unidimensional target-free measure of commitment
        ii. Optimism: measured using the Life Orientation Test – Revised (Scheier et al., 1994).
    b. Dependent Variable(s)
        i. Consequential choice: participants will make a consequential choice between to-date and to-go goal progress framing by choosing one of two goal progress tracking worksheets. Worksheet A emphasizes to-date progress, and Worksheet B emphasizes to-go progress.
        ii. Continuous ratings: participants will provide ratings of how motivating they think each worksheet (A and B) would be for tracking their progress

on their focal goal by responding to 8 items (4 per worksheet). A composite score will be computed for each worksheet.

c. Exploratory Variable(s)
    i. Goal Progress: participants will report their current level of progress on their focal goal using a sliding scale, from 0-100 percent.

4. Sampling Plan

a. Participants/Sample Description
    i. Undergraduate psychology students at a large Canadian university.
b. Data Collection Procedures
    i. Participants will be recruited through the psychology department's participant management system and will receive 0.5 participation credits for 30 minutes of participation. Data will be collected online, using a survey administered through Qualtrics.
    ii. Data collection will begin on January 28, 2022 and will continue until the target sample size is reached.
c. Projected Sample Size
    i. $N = 220$
d. Sample Size Rationale
    i. To determine an estimated sample size, we conducted an a priori power analysis in G*Power version 3.1.9.7. The analysis showed that a sample size of 188 will provide 99% power to detect an effect size of $\rho = .30$ (based on prior work) at the standard .05 alpha error probability for our primary analysis (i.e., point biserial correlation; two-tailed). To account for potential exclusions, we aim to recruit at least 220.
e. Stopping Rule
    i. Data collection will stop once we reach our target N ($N = 220$)

5. Exclusion Criteria

a. Participants are asked to answer "*How distracted were you during the study*" and "*How seriously did you take the study*" on a scale from 1 (*not at all*) to 5 (*extremely*). Anyone who reports 4-5 for distracted or 1-2 for seriousness will be excluded from analyses.

6. Analysis Plan

a. Outliers
    i. Univariate outliers with scores > 3 *SD*s from the mean will be winsorized to ± 3 *SD*s to minimize their influence on results (Tabachnik & Fidell, 2007). Where numerous cases (> 2%) or very extreme values (> 4 *SD*s) have been winsorized, analyses will be performed with and without winsorization.
b. Missing Data
    i. Generally, we will handle missing data by pairwise—not listwise—exclusion (i.e., participants missing data for specific variables will be excluded from analyses involving those variables but may be included in models using other variables).
    ii. For missing items within larger composite scales, the measures will be computed by averaging across the items where data is present.
c. Variable/Composite Creation

i. Commitment: a composite score will be created by averaging each participant's responses to all items of the commitment measure. This will yield a score from 1-7, with higher scores indicating higher commitment.
ii. Consequential choice: participant choices will be coded as 0 = to-date and 1 = to-go.
iii. Continuous ratings of worksheets: a composite score for each worksheet/framing option (Worksheet A = to-date, Worksheet B = to-go) will be created by averaging each participants' responses to the 4 items about each worksheet.
iv. Goal progress: participants will report their current level of progress on their focal goal using a sliding scale, from 0-100 percent.
v. Optimism: after reverse-scoring as required (items 3, 7, and 9), a composite score will be created by averaging each participant's responses to items 1, 3, 4, 7, 9, and 10 of the LOT-R (items 2, 5, 6, and 8 are filler items and are thus omitted from the composite score). This will yield a score from 1-5, with higher scores indicating greater optimism.

vi. Binary choices: choices will be coded as 0 = to-date and 1 = to-go.

d. Statistical Models
i. Descriptive Statistics: means, medians, standard deviations, skewness, kurtosis, etc. will be computed for every variable.
ii. Point-biserial correlation: to determine if goal commitment predicts choice of to-date or to-go progress framing, a point-biserial correlation will be conducted. This analysis will examine the association between commitment (a continuous variable) and progress framing choice (to-date or to-go). A significant positive correlation between commitment level and to-go choice would indicate that participants demonstrate accurate metamotivational knowledge.
iii. Bivariate correlation: to examine participants' continuous ratings of how motivating to-date and to-go framing would be at varying levels of commitment, I will conduct a bivariate correlation analysis examining the association between commitment level and continuous ratings of motivation for each type of progress framing (to-date and to-go). If participants demonstrate accurate metamotivational knowledge, this analysis should show a significant positive correlation between commitment level and to-go ratings, and a significant negative correlation between commitment level and to-date ratings.
iv. Multiple regression: to examine the interaction between goal commitment and optimism on to-date and to-go progress ratings, I will conduct multiple regression analyses. Where significant or marginal ($p < .100$) interaction effects emerge, follow-up models will be conducted examining the effect of goal commitment at low (-1 *SD*) and high (+1 *SD*) levels of optimism.

Appendix A3: Study 5 Analysis Plan

1. Background

a. Previous research has demonstrated that whether it helps to focus on the starting line or the finish line depends on how committed people are to their goals (Koo & Fishbach, 2008). More specifically, if a person is highly committed to a goal, thinking about how much they have left to accomplish — "to-go" information — is more motivating, whereas if a person's commitment level is low or uncertain, thinking about what has already been accomplished — "to-date" information — is more motivating. Our prior work reveals that, on average**,** people's metamotivational beliefs align with what is normatively accurate, though there is also substantial variability in these beliefs. We've explored these beliefs using a scenario-based assessment in the context of motivating the self and motivating someone else. Recently, we also found some evidence of normatively accurate beliefs when examining people's behavioural choices for their personal goals. The present study aims to extend this research by examining whether people demonstrate normatively accurate metamotivational beliefs making a consequential choice for someone else. Participants will read a fictitious profile describing a student's goal, with the student's description of their goal commitment being experimentally manipulated to be either high/certain, low/uncertain, or not provided. Participants will then choose which of two progress trackers (emphasizing either progress to-date or to-go) they recommend the student should use to support their motivation during goal pursuit. Participants will also rate how motivating they think each progress tracker would be for the student.

2. Design Plan

a. Study Type

i. Experimental

b. Blinding

i. Participants will not know the treatment group to which they have been assigned.

c. Study Procedure

i. Participants will be told that the study explores how people motivate others. As part of the cover story, participants are told that we have teamed up with an organization dedicated to helping university students manage their goals, and that they will be randomly assigned to a profile of a student and will make recommendations about their goal which will be used to support the student and inform the organization's approach. Participants will then be randomly assigned to read a fictitious goal description that describes the student's commitment to the goal as either high, low, or provides no information. Participants will then be presented with two progress trackers (emphasizing either progress to-date or to-go), and will be asked to choose which tracker they recommend would be most motivating for the student to use. They will also rate how motivating/helpful each tracker is. Finally, they will also complete a measure of optimism, along with basic demographic information.

3. Variables

a. Independent Variable(s)

i. Goal commitment: manipulated by varying the information provided by the fictitious student about their level of goal commitment. There are 3 conditions: high and certain of commitment to the goal (high commitment condition), relatively low and uncertain of commitment to the goal (low commitment condition), and no information about commitment (neutral condition)

b. Dependent Variable(s)

i. Consequential choice: participants will make a binary choice between two online progress trackers that the student could use — one focusing on progress to-date and one focusing on progress to-go

ii. Continuous ratings: participants will provide ratings of how motivating and helpful they think each progress tracker would be for the student by responding to 8 items (4 per progress tracker) on a scale from 1(*extremely demotivating/unhelpful*) to 7 (*extremely motivating/helpful y*).. A composite score will be computed for each progress tracker.

iii. Commitment perceptions: to examine participant's perceptions of the student's commitment, participants will answer questions regarding the level of commitment (two questions – from Klein et al., 2014) and certainty of commitment (one question, self-devised) on a scale from 1(*not at all*) to 7 (*definitely*).

c. Exploratory Variable(s)

i. Optimism: in previous studies, we have found some evidence that dispositional optimism moderates the effect of commitment level on progress choices and ratings. To explore whether optimism moderates people's choices and ratings of progress framing for others, participants will complete the Life Orientation Test – Revised (Scheier et al., 1994).

4. Sampling Plan

a. Participants/Sample Description

i. United States-based adults.

b. Data Collection Procedures

i. Participants will be recruited from Amazon's Mechanical Turk using CloudResearch. Participation will be restricted to participants who reside in the United States, and who have completed at least 100 HITs with an approval rating greater than 95%. Data will be collected online, using a survey administered through Qualtrics.

ii. Data collection will begin on April 4, 2024 and will continue until the target sample size is reached.

c. Projected Sample Size

i. $N = 400$

d. Sample Size Rationale

i. To determine an estimated sample size, we conducted an a priori power analyses in GPower version 3.1.9.7. The analysis showed that a sample size of 387 will provide 95% power to detect an effect size of $w = .20$ (small-to-medium effect size, based on prior work) for our primary analysis (i.e., chi-square; df = 2; alpha error probability = .05). This estimated sample size of 387 would also provide sufficient power for our

secondary analysis of interest (repeated measures ANOVA with 3 groups and 2 repeated measurements), which requires a sample of 195 to provide 95% power to detect an effect size of $f = .175$ (alpha error probability = .05; correlation among repeated measure = .25; based on prior work).

ii. To account for potential exclusions, we aim to recruit 400.

e. Stopping Rule

i. Data collection will stop once we reach our target N ($N = 400$)

5. Exclusion Criteria

a. Participants are asked to answer "*How distracted were you during the study*" and "*How seriously did you take the study*" on a scale from 1 (*not at all*) to 5 (*extremely*). Anyone who reports 4-5 for distracted or 1-2 for seriousness will be excluded from analyses.

6. Analysis Plan

a. Missing Data

i. Generally, we will handle missing data by pairwise—not listwise—exclusion (i.e., participants missing data for specific variables will be excluded from analyses involving those variables but may be included in models using other variables).

b. Variable/Composite Creation

i. Commitment Perceptions: two composite scores for commitment perceptions will be created by 1) averaging the two items asking about perceptions of level of commitment, and 2) averaging all three items asking about commitment perceptions (two for commitment level and one for commitment certainty). The composite with the highest reliability will be used for primary analyses, though we will also examine commitment certainty and commitment level separately. Scores will range from 1-7, with higher scores representing perceptions of higher/certain commitment.

ii. Progress Tracker Ratings**:** a composite score for each progress tracker will be created by averaging each participants' responses to the 4 items about each tracker. This will yield a score from 1-7, with higher scores indicating that participants viewed the tracker as more motivating/helpful (vs. demotivating/unhelpful).

iii. Optimism: after reverse-scoring as required (items 3, 7, and 9), a composite score will be created by averaging each participant's responses to items 1, 3, 4, 7, 9, and 10 of the LOT-R (items 2, 5, 6, and 8 are filler items and are thus omitted from the composite score). This will yield a score from 1-5, with higher scores indicating greater optimism.

c. Statistical Models: For all relevant analyses, we will conduct tests comparing all three conditions, with follow-up tests to examine pairwise comparisons when $p < .10$. To more directly compare these results to prior studies, we will also conduct planned contrasts comparing the high and low commitment conditions for all relevant analyses.

i. Descriptive Statistics: means, medians, standard deviations, skewness, kurtosis, etc. will be computed for every variable.

ii. One-Way ANOVA: to determine if there are significant differences in perceptions of commitment between conditions, a one-way ANOVA will

be conducted. If $p < .10$, follow-up Tukey post-hoc tests will be conducted to test pairwise differences between all conditions. A planned contrast will also be conducted to test pairwise differences between high and low commitment conditions.

iii. Chi-Square Test: to determine whether there is a statistically significant association between the commitment conditions (high, low, and neutral) and progress tracker choice (to-date or to-go), a chi-square analysis will be conducted. If $p < .10$, follow-up post-hoc tests will be conducted using the R package "chisq.posthoc.test". A planned contrast will also be conducted comparing high and low commitment conditions.

iv. Repeated Measures ANOVA: to determine if there are any significant differences in progress trackers motivation ratings across commitment conditions, a repeated measures ANOVA will be conducted. If $p < .10$, follow-up Tukey post-hoc tests will be conducted. A planned contrast will also be conducted to test pairwise differences between high and low commitment conditions.

Appendix B

Additional Measures

The present studies included additional measures that were not the focus of the current dissertation, including personality and individual difference measures as well as goal-related measures. These measures have not been analyzed unless explicitly stated. Details are provided below.

Study 1

Proactive Personality

Proactive personality was measured using the Proactive Personality Scale (Seibert et al., 1999). A sample item is "I am constantly on the lookout for new ways to improve my life." Participants were instructed to rate the extent to which they agreed with each item on a scale from 1 (*strongly disagree)* to 7 *(strongly agree).*

Lay Theories of Motivation

Lay theories of motivation was measured using an unpublished scale by King et al. Sample items include "No matter how hard you try, you cannot really change how motivated you are", "You have very little control over your motivation", and "You can learn to change your motivation". Items were rated on a scale from 1 (*strongly disagree)* to 7 (*strongly agree).*

Study 3a and 3b

Self-Monitoring

Self-monitoring was measured using the Revised Self-Monitoring Scale (Lennox & Wolfe, 1984). Sample items include "I have the ability to control the way I come across to people, depending on the impression I wish to give them" and "I am often able to read people's

true emotions correctly through their eyes." Participants were instructed to rate the extent to which each item was true of themselves, on a scale from 0 (a*lways false)* to 5 *(always true)*.

Dispositional Optimism

Optimism (analyzed in Studies 3c and 3d; see Appendix F) was measured using the Life Orientation Test-Revised (Scheier et al., 1994). Sample items include "In uncertain times, I usually expect the best" and "If something can go wrong for me, it will". Participants were instructed to rate their agreement with each statement on a scale from 1 (*strongly disagree)* to 5 (s*trongly agree)*.

Study 4

Progress Tracking Choice: Open-Ended Question

For exploratory purposes, the following open-ended question was presented to participants following their progress tracking choice and ratings: "You chose *progress tracking choice piped in* instead of *other option piped in*. Why did you choose * progress tracking choice piped in* instead of * other option piped in *? Please be as detailed as possible, there are no wrong answers! The feedback you provide here will be used to guide future research, so any information you share is helpful and appreciated."

Study 5

Dispositional Optimism

Measured using the Life Orientation Test-Revised (Scheier et al., 1994).

Study 6

Goal Properties (Time 1)

For each goal, participants responded to the following questions on a scale from 1 (*not at all)* to 7 (extremely*)*: 1) "How important is this goal?", 2) "How challenging do you think it will

be to attain this goal?", and 3) "To what extent do you feel you have the skills and resources necessary to attain this goal?"

Goal Motivations (Time 1)

For each goal, participants responded to the following items on a scale from 1 (*not at all)* to 7 *(completely)*: "I pursue this goal …" 1) "because I really identify with the goal" (identified motivation), 2) "because of the enjoyment or stimulation that this goal would provide me" (intrinsic motivation), 3) "because of the external rewards such as money or status that the goal may produce" (external motivation), and 4) 'because I would feel ashamed, guilty, or anxious if I did not have this goal" (introjected motivation).

Grit (Time 1 and 2)

Grit was measured using the Short Grit Scale (Duckworth & Quinn, 2009). Sample items include "Setbacks don't discourage me" and "I finish whatever I begin." Participants were instructed to rate each item on a scale from 1 *(not like me at all)* to 5 *(very much like me)*.

Dispositional Optimism (p2)

Measured using the Life Orientation Test-Revised (Scheier et al., 1994).

Hope (Time 2)

Hope was measured using the Hope Scale (Snyder et al., 1991). Sample items include "I can think of many ways to get out of a jam" and "I energetically pursue my goals." Participants were instructed to rate each item on a scale from 1 *(definitely false)* to 5 *(definitely true).*

Appendix C

To-Date/To-Go Scenario Beliefs Assessment (Study 1a Version)

Instructions

People often use certain strategies when trying to motivate themselves to achieve their goals. Sometimes this might involve thinking about the same goal in different ways. For example, you could encourage yourself to consider how much you have done so far, or instead you could encourage yourself to consider how much you have left to go.
For this part of the survey, you will be asked to imagine yourself pursuing different goals in several scenarios and respond to a few questions for each scenario.

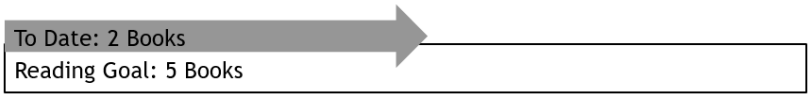
Structure (*Example: Scenario 1 Reading Goal, Strong Commitment Version*)

Goal Description:

Imagine that you have a goal of increasing the amount of time you spend reading by reading at least 5 books over the course of 2 months, and **you are very committed to this goal**. Although you have other responsibilities in life, you are certain this is among your top priorities right now. At this point, you have read 2 books.
Binary Choice DV:

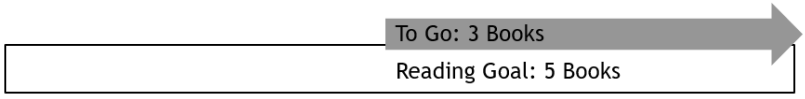
To help motivate yourself to achieve this goal, would you rather focus on:

a) how many books you have read since you started pursuing this goal



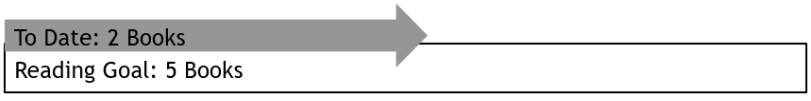
or

b) how many books you have left to read before you reach this goal

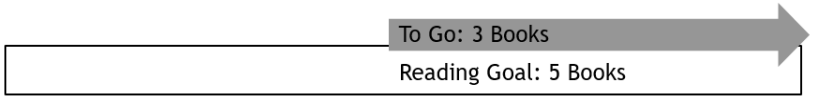


Continuous Ratings DV:
To what extent do you think it would be motivating for you to focus on:

a) how many books you have read since you started pursuing this goal
1 (*extremely demotivating*) to 7 (*extremely motivating*)



b) how many books you have left to read before you reach this goal
1 (*extremely demotivating*) to 7 (*extremely motivating*)



Goal Scenarios

1. *Reading Goal*: Imagine that you have a goal of increasing the amount of time you spend reading by reading at least 5 books over the course of 2 months ... At this point, you have read 2 books.
2. *Volunteering Goal*: Imagine that you have a goal to volunteer for 50 hours this month ... At this point, you have volunteered a total of 24 hours.
3. *Fundraising Goal*: Imagine that you have a goal of raising $400 for a charity fundraiser you are volunteering for ... At this point, you have raised $192.
4. *Savings Goal*: Imagine that you are saving money to buy a new car worth $10,000 ... At this point, you have saved $4800.
5. *Debt Elimination Goal*: Imagine that you are working toward eliminating your credit card debt of $2,500 ... At this point, you have paid off $1,200.
6. *Sales Goal*: Imagine that you work in sales and set a goal to beat the current company record of 126 sales in a month ... At this point, you have made 61 sales.
7. *Learning Goal*: Imagine that you have the goal of learning Spanish and you signed up for a free online Spanish class with a total of 20 learning modules ... At this point, you have completed 8 modules.
8. *Distance Goal*: Imagine that you have the goal to run 50 miles over the course of a month ... At this point, you have run 23 miles.

Additional Questions
1. How relevant are each of the following goals in your own life?
2. How important are each of the following goals in your own life?
Scale: 1 (*extremely irrelevant/unimportant*) – 7 (*extremely relevant/important*)

Goals:
- Increasing the amount of time spent reading
- Saving up money for a big purchase
- Eliminating debt
- Beating a record at work
- Learning a new language
- Achieving a specific fitness goal
- Volunteering
- Raising money for charity

Appendix D

Exploring Weak and Strong Knowledge Subcomponents

Study 2a

Study 2a in my dissertation revealed no significant correlations with overall metamotivational knowledge, but exploratory analyses examining the subcomponents revealed a few significant correlations with strong and weak commitment knowledge separately (see Table D). Though these correlations were relatively modest, *r*s < .25, an unexpected and interesting pattern did emerge. Specifically, strong commitment knowledge was positively correlated with constructs that might typically be considered beneficial, such as conscientiousness, openness, and BAS (behavioural approach system), whereas weak commitment knowledge was negatively correlated with these constructs.

This could be considered unexpected given that metamotivation research in other domains, such as regulatory focus or construal level, has typically found that normatively accurate beliefs are unrelated to broader self-regulatory and personality constructs. However, when further considering what these subcomponents represent, these correlations may also reflect underlying motivational preferences. The weak commitment knowledge component essentially captures the degree to which people rate to-date framing as more motivating than to-go framing (in weak commitment contexts), while the strong commitment knowledge component captures the degree to which people rate to-go framing as more motivating than to-date framing (in strong commitment contexts).

The observed correlations may thus reflect natural alignment between personality traits and framing preferences. For instance, individuals high in consciousness, grit, and proactive tendencies—traits associated with forward looking, goal-completion orientations—may naturally

find to-go framing (focusing on what remains to be accomplished) more appealing, regardless of context. Conversely, those lower on these traits may find to-date framing (focusing on past accomplishments) more inherently appealing. This suggests that when the subcomponents are examined separately, they may tap into motivational preferences rather than strategic metamotivational knowledge, which is more appropriately captured by understanding the interaction between commitment level and optimal framing choice. These unanticipated patterns reaffirm the possibility that examining the relationship between these beliefs and outcomes may not be a straightforward process.

Table D

Discriminant Validity

Scale	*N*	Details: Example item (scale points)	Total Knowledge	Strong Commit Knowledge	Weak Commit Knowledge
Self-Regulation Ability (Fishbach et al., 2003)	170	"To what extent are you successful at achieving your goals?" (1 = not at all successful, 7= extremely successful)	-.02	.09	-.09
Self-Control (Tangney et al., 2004)	170	"I am good at resisting temptation." (1 = does not describe me, 5 = describes me extremely well)	.04	.11	-.08
Promotion Focus (Higgins et al., 2001)	186	"I feel like I have made progress toward being successful in my life." (1 = certainly false, 5 = certainly true)	.05	.03	.01
Prevention Focus (Higgins et al., 2001)	186	"How often did you obey rules and regulations that were established by your parents?" (1 = never or seldom, 5 = always)	.002	-.08	.08
Mastery Approach Motivation (Elliot & Murayama, 2008)	186	"My goal is to learn as much as possible." (1 = completely disagree, 5 = completely agree)	-.02	.11	-.12
Mastery Avoidance Motivation (Elliot & Murayama, 2008)	186	"My aim is to avoid learning less than I possibly could." (1 = completely disagree, 5 = completely agree)	-.03	.03	-.04
Performance Approach Motivation (Elliot & Murayama, 2008)	186	"My aim is to perform well relative to others." (1 = completely disagree, 5 = completely agree)	.04	.11	-.07
Performance Avoidance Motivation (Elliot & Murayama, 2008)	186	"My aim is to avoid doing worse than others." (1 = completely disagree, 5 = completely agree)	.09	.10	-.03
Behavioural Activation System (Carver & White, 2013)	186	"I go out of my way to get things I want." (1 = very true for me, 4 = very false for me)	.02	.12	-.10
Behavioural Inhibition System (Carver & White, 2013)	186	"I feel worried when I think I have done poorly at something important." (1 = very true for me, 4 = very false for me)	.07	.12	-.04
Behavioural Activation System (Corr & Cooper, 2015)	186	"I am often preoccupied with unpleasant thoughts." (1 = not at all, 4 = highly)	.04	**.19****	**-.15***
Behavioural Inhibition System (Corr & Cooper, 2015)	186	"I'm motivated to be successful in my personal life." (1 = not at all, 4 = highly)	.09	.12	-.04
Fight-Flight-Freeze System (Corr & Cooper, 2015)	186	"I am the sort of person who easily freezes-up when scared." (1 = not at all, 4 = highly)	-.004	-.09	.08
Mindfulness (Brown & Ryan, 2003)	186	"I find it difficult to stay focused on what's happening in the present." (reverse-scored; 1 = almost always, 6 = almost never)	-.01	-.06	.05
Conscientiousness (MacCann et al., 2009)	186	"I demand quality." (1 = not at all like me, 5 = very much like me)	-.03	**.12**†	**-.14**†

Conscientiousness (Donnellan et al., 2006)	179	"I like order." (1 = very inaccurate, 5 = very accurate)	-.07	**.21****	**-.25*****
Openness (Donnellan et al., 2006)	179	"I am not interested in abstract ideas." (reverse-scored; 1 = very inaccurate, 5 = very accurate)	.09	**.22****	**-.14**†
Agreeableness (Donnellan et al., 2006)	179	"I sympathize with others' feelings." (1 = very inaccurate, 5 = very accurate)	.02	**.13**†	-.11
Extraversion (Donnellan et al., 2006)	179	"I am the life of the party." (1 = very inaccurate, 5 = very accurate)	-.02	.02	-.03
Neuroticism (Donnellan et al., 2006)	179	"I have frequent mood swings." (1 = very inaccurate, 5 = very accurate)	.01	-.01	.01
Proactive Personality (Seibert et al., 1999)	170	"I am constantly on the lookout for new ways to improve my life." (1 = strongly disagree, 7 = strongly agree)	-.08	**.13**†	**-.18***
Hope (Snyder et al., 1991)	170	"I can think of many ways to get out of a jam." (1 = definitely false, 4 = definitely true)	-.04	.13	**-.14**†
Grit - Perseverance (Duckworth & Quinn, 2009)	170	"I finish whatever I begin." (1 = does not describe me, 5 = describes me extremely well)	-.04	**.13**†	**-.16***
Grit - Consistency (Duckworth & Quinn, 2009)	170	"I often set a goal but later choose to pursue a different one." (reverse-scored; 1 = does not describe me, 5 = describes me extremely well)	-.09	.02	-.07
John Henryism (James et al., 1983)	170	"I believe that hard work is the best possible way for a person to get ahead in life" (1 = does not describe me, 5 = describes me extremely well)	-.03	**.16***	**-.17***
Spontaneous Self-Distancing (Ayduk & Kross, 2010)	170	Recall rejection experience (1 = mainly immersed participant, 7 = mainly distanced observer)	-.08	-.07	.01
Emotion Reappraisal (Gross & John, 2003)	170	"I control my emotions by changing the way I think about the situation I'm in." (1 = strongly disagree, 7 = strongly agree)	.01	.08	-.07
Emotion Suppression (Gross & John, 2003)	170	"I keep my emotions to myself." (1 = strongly disagree, 7 = strongly agree)	-.06	.02	-.07
Positive Emotion Expression (Burton & Bonanno, 2016)	170	"A coworker gets a promotion and wants to talk about it." (1 = unable [to be even more expressive], 7 = very able [to be even more expressive])	.03	**.14**†	-.11
Negative Emotion Expression (Burton & Bonanno, 2016)	170	"You're attending the funeral of someone you don't know." (1 = unable [to be even more expressive], 7 = very able [to be even more expressive])	-.02	**.24****	**-.24****
Positive Emotion Suppression (Burton & Bonanno, 2016)	170	"During a meeting with a supervisor, his/her phone unexpectedly begins to play an embarrassing ringtone." (1 = unable [to conceal], 7 = very able [to conceal])	.02	-.01	.02
Negative Emotion Suppression (Burton & Bonanno, 2016)	170	"You are on a first date at a restaurant having dinner, and a stranger spills their drink on you." (1 = unable [to conceal], 7 = very able [to conceal])	.002	**.16***	**-.15**†

Note: †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Appendix E

To-Date/To-Go Metamotivational Beliefs Assessment

Studies 3a, 3b, 4, 6, and 7 included the metamotivational beliefs assessment from Study 1a. It was included in Studies 3a, 3b, and 4 for exploratory purposes (e.g., to explore the relationship between beliefs and choice in Study 3; see Appendix F). In Studies 6 and 7, it was included to create an index of metamotivational knowledge to use as a predictor for self-regulatory outcomes. These studies demonstrated a pattern of results consistent with the Studies 1 and 2 in the dissertation. Analyses are presented below for transparency.

Binary Choice

Applying the same analytic approach as Study 1a, results revealed that participants exhibited a similar pattern of beliefs as in Study 1. More specifically, results revealed that there were significantly higher odds of participants choosing to-go for strong commitment versus weak commitment scenarios in all studies: ***Study 3a***: OR = 1.64, $z = 12.93$, $p < .001$, 95% CI [1.52, 1.76]; ***Study 3b***: OR = 1.79, $z = 12.16$, $p < .001$, 95% CI [1.63, 1.96]; ***Study 4***: OR = 1.42, $z = 7.25$, $p < .001$, 95% CI [1.29, 1.56]; ***Study 6 (Time 1)***: OR = 1.50, $z = 10.13$, $p < .001$, 95% CI [1.38, 1.62]; ***Study 6 (Time 2)***: OR = 1.87, $z = 14.92$, $p < .001$, 95% CI [1.72, 2.03]; and ***Study 7***: OR = 1.45, $z = 11.71$, $p < .001$, 95% CI [1.36, 1.54].

Continuous Ratings

Examining the continuous ratings, results revealed a significant commitment by framing interaction for all studies (see Table E).

Simple slopes analyses revealing that, for weak commitment scenarios, to-date was seen as more motivating than to-go in all studies; ***Study 3a***, $b = -0.16$, $p < .001$; ***Study 3b***, $b = -0.20$, p

< .001; ***Study 4***, *b* = -0.25, *p* < .001; ***Study 6 (Time 1)***, *b* = -0.19, *p* < .001; ***Study 6 (Time 2)***, *b* = -0.24, *p* < .001; ***Study 7***, *b* = -0.23, *p* < .001.

Conversely, for strong commitment scenarios, to-go was seen as more motivating than to-date in ***Study 3a***, *b* = 0.11, *p* < .001, ***Study 3b***, *b* = 0.21, *p* < .001, ***Study 6 (Time 1)***, *b* = 0.07, p < .001, and ***Study 6 (Time 2)***, *b* = 0.11, p < .001. However, this effect was non-significant in ***Study 4***, *b* = -0.03, *p* = .23, and ***Study 7***, *b* = 0.02, *p* = .25 (consistent with Study 1b).

Table E

Commitment and Progress Framing Predicting Motivation Ratings for Studies 3a, 3b, 4, 6 (Time 1 and 2), and 7

Study	Predictor	*b*	SE	*t*	*p*	[95% CI]
3a	Intercept	5.12	0.05	101.49	<.001	[5.02, 5.22]
	Commitment	0.18	0.01	13.91	<.001	[0.16, 0.21]
	Progress Framing	-0.03	0.01	-2.20	.028	[-0.05, -0.00]
	Commitment x Progress Framing	0.13	0.01	10.38	<.001	[0.11, 0.16]
3b	Intercept	4.98	0.06	85.74	<.001	[4.87, 5.09]
	Commitment	0.18	0.01	10.49	<.001	[0.15, 0.22]
	Progress Framing	0.01	0.01	0.36	.721	[-0.03, 0.04]
	Commitment x Progress Framing	0.21	0.01	11.94	<.001	[0.17, 0.24]
4	Intercept	5.02	0.06	87.89	<.001	[4.90, 5.13]
	Commitment	0.14	0.02	9.14	<.001	[0.11, 0.17]
	Progress Framing	-0.14	0.02	-8.91	<.001	[-0.17, -0.11]
	Commitment x Progress Framing	0.11	0.02	7.23	<.001	[0.08, 0.14]
$6_{\text{Time 1}}$	Intercept	5.04	0.06	88.05	<.001	[4.93, 5.15]
	Commitment	0.20	0.01	13.54	<.001	[0.17, 0.23]
	Progress Framing	-0.06	0.01	-3.88	<.001	[-0.09, -0.03]
	Commitment x Progress Framing	0.13	0.01	8.75	<.001	[0.10, 0.16]
$6_{\text{Time 2}}$	Intercept	4.90	0.06	86.28	<.001	[4.79, 5.01]
	Commitment	0.27	0.01	19.45	<.001	[0.25, 0.30]
	Progress Framing	-0.06	0.01	-4.58	<.001	[-0.09, -0.04]
	Commitment x Progress Framing	.017	0.01	12.39	<.001	[0.15, 0.20]
7	Intercept	4.86	0.05	98.26	<.001	[4.76, 4.96]
	Commitment	0.21	0.01	17.27	<.001	[0.19, 0.24]
	Progress Framing	-0.11	0.01	-8.69	<.001	[-0.13, -0.08]
	Commitment x Progress Framing	0.18	0.01	10.32	<.001	[0.10, 0.15]

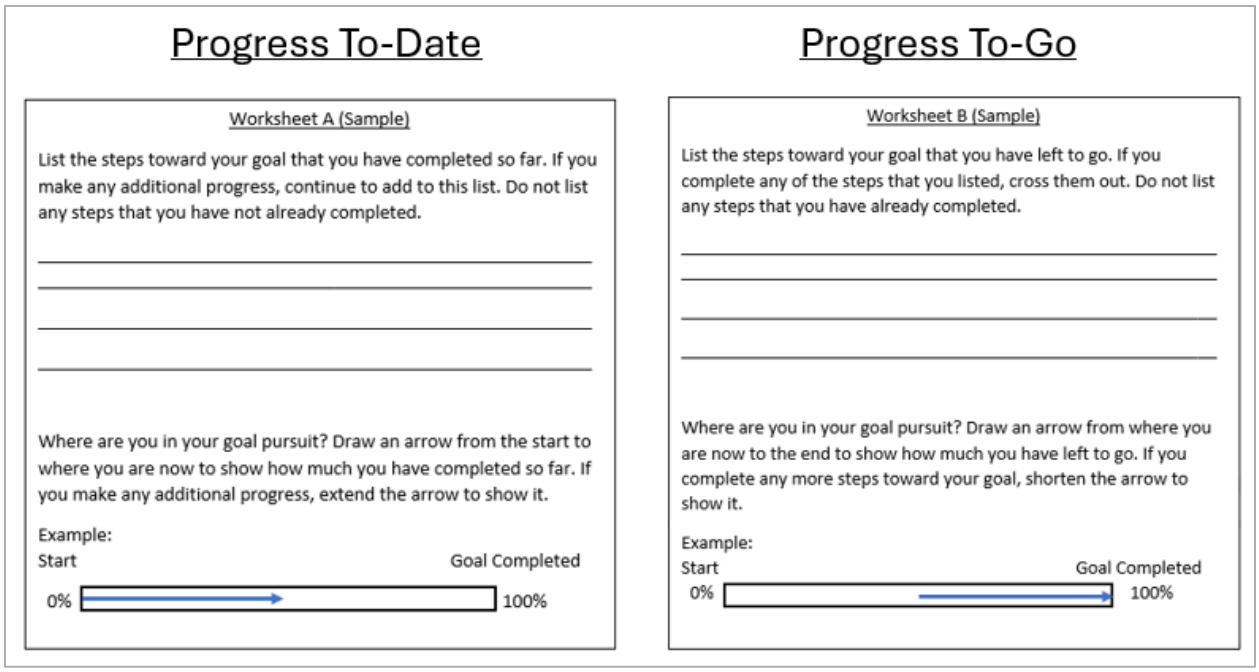
Appendix F

Study 3 Materials and Additional Analyses

To-Date and To-Go Progress Tracking Worksheets

Figure F

Progress Tracking Worksheets



Study 3a Commitment Manipulation

Beyond examining people's beliefs found when making a choice with their own goals, an additional aim of Study 3a was to explore the relationship between commitment and choices when goal commitment was manipulated directly.

To do this, participants in Study 3a were asked to rank their listed goals in order from highest to lowest importance and were assigned their third-ranked goal as their focal goal. To manipulate participants' level of commitment to their focal goal, they were reminded of how they ranked their focal goal using language that emphasized either high or weak commitment. In the strong commitment condition, the reminder was "You ranked this goal third. It was in your top 3,

which shows that you prioritize this goal more than other goals". In the weak commitment condition, the reminder was "You ranked this goal third, which shows that you prioritize this goal less than other goals". Participants then either completed a measure of goal commitment for the selected goal or completed the choice task (order was counterbalanced).

To assess the effectiveness of the commitment manipulation, a composite score was computed for each participant as an index of goal commitment (on a scale from 1-7, with higher scores indicating greater commitment). An independent samples t-test was conducted to compare the mean level of commitment in the strong vs. weak commitment conditions. There was no significant difference in commitment in the strong (M = 5.34, SD = 1.10) and weak (M = 5.27, SD = 1.03) commitment conditions, $t(239) = 0.50$, $p = .364$.

The failure of the commitment manipulation in this study might be attributed to several potential factors. Firstly, the manipulation might not have been strong enough to create a noticeable difference in perceived commitment. That is, the subtle language cues used may not have been strong enough to influence participants' perceptions. Secondly, even though participants were asked to rank their goals in terms of importance, it is likely that participants were at least somewhat, if not highly, committed to the goals they listed. This could have occurred because strong commitment goals are likely more accessible than weak commitment goals (see Higgins, 1996). If this were the case, weak commitment relative to the other goals that a participant listed could still be quite high, causing the weak commitment manipulation to fail. Indeed, results suggest that participants in both conditions reported commitment ratings that were significantly above the midpoint of the scale (3.5; ps < .001), suggesting that goal commitment was fairly high in general. These are just some possibilities as to why the manipulation was unsuccessful in the present context, highlighting the need for future work to

further test manipulations designed to establish a causal relationship between commitment and progress framing choices.

To-Date/To-Go Scenario Beliefs Assessment and Worksheet Choice/Ratings

The scenario-based assessment was included as an exploratory measure in Studies 3a and 3b to explore whether metamotivational beliefs assessed using the hypothetical scenario assessment related to people's beliefs in the context of their own goals. If scenario-based metamotivational beliefs were related to real-life goals, I would expect scenario-based metamotivational beliefs to interact with personal goal commitment to predict worksheet choice and worksheet ratings. Specifically, one might expect that for those who were higher in commitment, higher accuracy on the scenario assessment would predict a preference for the to-go worksheet, whereas for those who were lower in commitment, higher accuracy on the scenario assessment would predict a preference for the to-date worksheet. However, exploratory analyses did not reveal a significant interaction between accuracy on the scenario assessment and commitment predicting choice.

Analysis Summary

The binary choice dependent variable (coded 0 = to-date worksheet, 1 = to-go worksheet; Table F1) and both of the worksheet rating dependent variables (Table F2) were regressed onto metamotivational knowledge, commitment, and their interaction using logistic and linear

Table F1

Metamotivational Knowledge and Commitment Predicting Worksheet Choice

Study	Predictors	*b*	*SE*	Wald	*p*	OR [95% CI]
3a	Intercept	-0.16	0.13	1.50	.220	0.85
	Knowledge	.27	.11	6.24	.013	1.31 [1.06, 1.62]
	Commitment	.24	.13	3.51	.061	1.27 [0.99, 1.62]
	Know x Commitment	.07	.10	.545	.460	1.07 [0.89, 1.29]
3b	Intercept	-0.30	0.17	3.11	.078	0.74
	Knowledge	0.21	0.11	3.40	.065	1.23 [0.99, 1.53]
	Commitment	0.34	0.15	5.09	.024	1.41 [1.05, 1.90]
	Know x Commitment	0.06	0.10	0.29	.589	1.06 [0.86, 1.30]

regression models.[20] Importantly, the critical Knowledge x Commitment interaction was non-significant in all models.

There was some consistency in the results for the main effect of commitment in the present analyses and what was observed in the main text, such that having higher commitment predicted choosing the to-go worksheet and rating it as more motivating. However, commitment was not a significant predictor of to-date worksheet ratings in the present analyses. The relationship between metamotivational knowledge and worksheet choice/ratings was more mixed: higher metamotivational knowledge predicted choosing the to-go worksheet in Study 3a (non-significant in Study 3b) but did not predict ratings of the to-go worksheet in either study. It was also a positive predictor of to-date worksheet ratings in Study 3a but was non-significant in

[20] Continuous predictors were mean-centered prior to regression analyses. Additional exploratory analyses controlling for goal progress and the interaction between metamotivational knowledge and goal progress were also conducted, but they did not emerge as significant predictors of worksheet choice or ratings, nor did they change the pattern of results for the main effects of metamotivational knowledge and commitment. Additional analyses were also conducted for Study 3a controlling for commitment condition, but it had no significant effect nor did it change the overall pattern of results.

Study 3b. Thus, the direct relationship between metamotivational knowledge and worksheet choice/ratings was relatively mixed, suggesting the need for additional work to further explore the relationship between the two.

Table F2

Metamotivational Knowledge and Commitment Predicting To-Date and To-Go Worksheet Ratings

Study	Predictors	*b*	*SE*	*t*	*p*	R^2	*F*
		To-Date Worksheet Ratings					
3a	Intercept	5.14	0.07	70.00	<.001	.08	$F(3, 237) = 7.05$,
	Knowledge	-0.26	-0.06	-4.40	<.001		$p < .001$
	Commitment	0.08	0.07	1.18	.238		
	Know x Commitment	-0.07	0.05	-1.35	.177		
3b	Intercept	4.96	0.10	51.07	<.001	.01	$F(3, 147) = 0.55$,
	Knowledge	-0.04	0.06	-0.70	.487		$p = .646$
	Commitment	-0.06	0.08	-0.77	.441		
	Know x Commitment	0.04	0.06	0.66	.510		
		To-Go Worksheet Ratings					
3a	Intercept	5.16	0.08	67.56	<.001	.06	$F(3, 237) = 4.95$,
	Knowledge	0.08	0.06	1.40	.164		$p = .002$
	Commitment	0.23	0.07	3.22	.001		
	Know x Commitment	-0.07	0.05	-1.38	.169		
3b	Intercept	5.13	0.10	53.36	<.001	.10	$F(3, 147) = 5.25$,
	Knowledge	0.11	0.06	1.73	.086		$p = .002$
	Commitment	0.29	0.08	3.46	<.001		
	Know x Commitment	0.01	0.06	0.20	.840		

In sum, I did not find evidence that scenario-based metamotivational beliefs interacted with personal goal commitment to predict worksheet choice and worksheet ratings. Past work in

other metamotivational domains has often found that metamotivational beliefs assessed using these scenario-based measures are linked to consequential choice and performance (Hubley et al., 2024; MacGregor et al., 2017; Nguyen et al., 2019, 2022; Ross et al., 2023). Thus, it is puzzling why I did not find such an association in the present context—particularly given that I found similar patterns across the scenario assessment and the personal goal progress framing choice measure. Specifically, people's beliefs generally aligned with the normative effects observed in the literature, with hints towards slightly reduced sensitivity when commitment was high. Certainly, this gives us pause in the capacity of the scenario assessment to predict behaviour and choice, indicating the need for additional work on this measure to predict real-life outcomes and behaviour. However, the primary goal of the present research was to assess people's metamotivational beliefs in this domain. The fact that I observed similar patterns across two very different methods for assessing beliefs gives us confidence that I are accurately capturing people's beliefs about to-date and to-go progress framing.

Although more work is needed to further test the relationship between beliefs assessed using the scenario measure and people's beliefs when making the decision in the context of their own goals, I can speculate on why the two might not appear to be directly related. For instance, it is possible that scenario-based beliefs appeared to be distinct from real-world behaviours due to differences in the salience of commitment certainty as a signal. More specifically, in the scenario-based assessment, commitment certainty is explicitly emphasized in the description of each scenario and is therefore highly salient to participants as they respond to the binary choice and continuous items. It is therefore highly likely that the scenario measure assesses participants' to-date and to-go preferences based on commitment as an explicit signal, making this measure a good indicator of to-date/to-go metamotivational beliefs using commitment as a signal.

Conversely, for progress framing choice, participants were asked to focus on their goal but were not encouraged to make their choice based on any specific features of their goal.

Optimism, and COVID-19

As was highlighted in the main text, the pattern of results from Study 3c deviated from the other samples in terms of the relationship between commitment and worksheet choice/ratings. It was these unexpected results that led us to conduct exploratory analyses with optimism as a moderator. I present those results below, followed by a discussion of how there may be moderators that influence metamotivational beliefs in this domain, which may be more or less relevant, depending on the circumstances. Specifically, I speculate on how the timing of data collection — particularly for Study 3c — in relation to COVID-19 may have influenced the results.

Optimism Analyses

Because Studies 1 and 2 suggest that people vary in the normative accuracy of their to-date/to-go metamotivational beliefs, an additional aim of Study 3 was to investigate an exploratory variable that may also influence people's choices to focus on to-date versus to-go progress. Dispositional optimism was chosen as this exploratory variable because prior research suggests that optimism is associated with higher goal expectancy, higher commitment, and greater perceived goal progress (e.g., Monzani et al., 2015; Segerstrom & Solberg Nes, 2006). Given that optimism influences people's perceptions and experiences of goal pursuit, I theorized that optimism might influence people's metamotivational beliefs about goal progress. Specifically, if people who are more optimistic have more positive expectations for future goal outcomes and higher goal commitment, optimism may predict a general preference for to-go framing. Thus, I planned to examine the main effect of optimism. However, I also explored

whether optimism moderated the effects of commitment on choice/ratings of progress framing. Specifically, I first conducted exploratory moderation analyses for Study 3c due to the unexpected pattern of results. I then included these moderation analyses in the pre-registered analysis plan for Study 3d. I present both the study-level and combined sample results below.[21] Notably, continuous predictors were mean centered to allow for interpretation of the main effect of optimism in models with interaction terms.

Progress Framing Choice. To examine whether optimism moderates the relationship between commitment and worksheet choice, logistic regression analyses with commitment, optimism, and the interaction between commitment and optimism as predictors were conducted. Results revealed no significant main effects of optimism in any samples, but there was a significant Commitment x Optimism interaction in Study 3c and the combined sample (see Table F3; this interaction was not significant in Study 3d). Tests of simple slopes revealed that, at higher (+1 *SD*) levels of optimism, each 1-unit increase in commitment was associated with an increase in the odds of choosing the to-go worksheet in Study 3c, OR = 1.63, $p = .046$, and the combined sample, OR = 1.53, $p < .001$. However, commitment was not reliably associated with worksheet choice for those who were lower (-1 *SD*) in optimism in Study 3c, $p = .492$, or the combined sample, $p = .356$. Thus, although the evidence is mixed, there is some evidence that for those who are higher in optimism, higher commitment was significantly related to choosing the to-go worksheet – mirroring the point biserial correlation found in Studies 3a, 3b, 3d, and the mega-analysis; whereas for those who are lower in optimism, there was no significant association.

[21] I also analyzed the combined sample while controlling for individual studies, and the pattern of results are consistent with the study-level results. Thus, I present the results without it for ease of interpretation.

Table F3

Commitment and Optimism Predicting Worksheet Choice

Study	Predictors	*b*	*SE*	Wald	*p*	OR [95% CI]
3a	Intercept	-0.17	0.12	1.64	.201	0.85
	Optimism	0.13	0.19	0.44	.509	1.13 [0.78, 1.64]
	Commitment	0.24	0.13	3.64	.056	1.27 [0.99, 1.62]
	Opt x Commit	0.16	0.19	0.72	.396	1.18 [0.81, 1.71]
3b	Intercept	-0.32	0.17	3.54	.060	0.73
	Optimism	-0.26	0.27	0.92	.338	0.77 [0.45, 1.32]
	Commitment	0.39	0.16	6.33	.012	1.48 [1.09, 2.01]
	Opt x Commit	0.38	0.24	2.43	.119	1.46 [0.91, 2.36]
3c	Intercept	-0.51	0.16	9.69	.002	0.60
	Optimism	0.09	0.25	0.14	.713	1.10 [0.67, 1.79]
	Commitment	0.18	0.17	1.22	.269	1.20 [0.87, 1.66]
	Opt x Commit	0.44	0.20	5.12	**.024**	1.56 [1.06, 2.28]
3d	Intercept	-0.15	0.15	1.00	.320	0.86
	Optimism	0.07	0.24	0.08	.760	1.08 [0.67, 1.74]
	Commitment	0.30	0.14	4.83	.028	1.36 [1.03, 1.78]
	Opt x Commit	0.09	0.20	0.20	.653	1.10 [0.74, 1.63]
Combined	Intercept	-0.25	0.08	12.11	<.001	0.77
	Optimism	0.04	0.11	0.12	.731	1.04 [0.83, 1.30]
	Commitment	0.25	0.07	12.93	<.001	1.29 [1.12, 1.48]
	Opt x Commit	0.25	0.10	6.77	**.009**	1.29 [1.06, 1.55]

Continuous Ratings. To examine whether optimism also moderated the relationship between commitment and participants' ratings of each worksheet, I conducted multiple regression analyses with commitment, optimism, and the interaction between commitment and optimism as predictors.

To-Date Worksheet Ratings. Results revealed a significant main effect of optimism in Study 3c (b = 0.28, p = .047), which was qualified by a significant Commitment x Optimism interaction; this interaction also emerged in Study 3b and the combined sample (see Table F4). Tests of simple slopes revealed that, at higher (+1 *SD*) levels of optimism, there was a negative association between commitment level and to-date ratings in Studies 3b (b = -0.27, p = .030) and Study 3c (b = -0.34, p = .013), indicating that participants rate the to-date worksheet as less helpful/motivating the more committed they are – reflecting normatively accurate beliefs. This relationship was non-significant in the combined sample, b = -0.32, p = .573. At lower (-1 *SD*) levels of optimism, participants rated the to-date worksheet as more motivating the higher their commitment was (Study 3c: b = 0.24, p = .014; Combined sample: b = 0.16, p = .001 – reflecting normatively "inaccurate" beliefs). This relationship was non-significant in Study 3b, b = 0.10, p = .402.

To-Go Worksheet Results. Results revealed a significant main effect of optimism in the combined sample (b = 0.15, p = .019), which was qualified by a significant Commitment x Optimism; this interaction also emerged in Studies 3a and 3c (see Table F5). Tests of simple slopes at 1 *SD* above and below the mean of optimism revealed that, at higher (+1 *SD*) levels of optimism, there was a positive association between commitment level and to-go ratings (Study 3a: b = 0.43 p < .001; Study 3c: b = 0.27, p = .039; Combined sample: b = 0.28, p < .001), indicating that participants viewed the to-go worksheet as more helpful/motivating the more committed they were – reflecting normatively accurate beliefs. There was no relationship between commitment and optimism at lower (-1 *SD*) levels of optimism (Study 3a: p = .781; Study 3c: p = .155; Combined sample: p = .300).

Table F4

Commitment and Optimism Predicting To-Date Worksheet Ratings

Study	Predictors	*b*	*SE*	*t*	*p*	R^2	*F*
3a	Intercept	5.14	0.08	67.20	<.001	.01	$F(3, 237) = 0.53$,
	Optimism	-0.02	0.11	-0.14	.892		$p = .659$
	Commitment	0.07	0.07	0.10	.319		
	Opt x Commit	-0.08	0.11	-0.71	.477		
3b	Intercept	4.98	0.10	51.91	<.001	.04	$F(3, 147) = 1.83$,
	Optimism	0.14	0.15	0.96	.337		$p = .145$
	Commitment	-0.09	0.08	-1.07	.286		
	Opt x Commit	-0.28	0.13	-2.13	**.034**		
3c	Intercept	5.22	0.09	55.89	<.001	.11	$F(3, 170) = 7.00$,
	Optimism	0.28	0.14	2.00	.047		$p < .001$
	Commitment	-0.05	0.09	-0.56	.576		
	Opt x Commit	-0.42	0.10	-4.08	**<.001**		
3d	Intercept	5.22	0.08	64.91	<.001	.05	$F(3, 175) = 2.87$,
	Optimism	-0.01	0.13	-0.06	.955		$p = .038$
	Commitment	0.18	0.07	2.59	.011		
	Opt x Commit	0.15	0.10	1.45	.149		
Combined	Intercept	5.13	0.04	118.74	<.001	.02	$F(3, 741) = 3.96$,
	Optimism	0.06	0.06	0.92	.358		$p = .008$
	Commitment	0.07	0.04	1.69	.092		
	Opt x Commit	-0.14	0.05	-2.67	**.008**		

Table F5

Commitment and Optimism Predicting To-Go Worksheet Ratings

Study	Predictors	*b*	*SE*	*t*	*p*	R^2	*F*
3a	Intercept	5.14	0.08	68.33	<.001	.09	$F(3, 237) = 7.66$,
	Optimism	0.19	0.11	1.80	.074		$p < .001$
	Commitment	0.23	0.07	3.24	.001		
	Opt x Commit	0.28	0.11	2.61	**.010**		
3b	Intercept	5.13	0.10	52.91	<.001	.08	$F(3, 147) = 4.27$,
	Optimism	-0.07	0.15	-.46	.644		$p = .006$
	Commitment	0.30	0.08	3.53	<.001		
	Opt x Commit	-0.02	0.13	-.17	.865		
3c	Intercept	5.04	0.09	57.31	<.001	.08	$F(3, 170) = 4.65$,
	Optimism	0.25	0.13	1.92	.057		$p = .004$
	Commitment	0.07	0.09	0.78	.438		
	Opt x Commit	0.29	0.10	2.96	**.004**		
3d	Intercept	5.17	0.09	57.80	<.001	.02	$F(3, 175) = 1.03$,
	Optimism	0.18	0.14	1.23	.221		$p = .381$
	Commitment	0.10	0.08	1.26	.210		
	Opt x Commit	0.05	0.11	0.41	.686		
Combined	Intercept	5.13	0.04	118.67	<.001	.04	$F(3, 741) = 11.41$,
	Optimism	0.15	0.06	2.34	.019		$p < .001$
	Commitment	0.17	0.04	4.27	<.001		
	Opt x Commit	0.17	0.05	3.12	**.002**		

Discussion

These exploratory analyses point to the possibility that there may be moderators that influence metamotivational beliefs in this domain, which may be more or less relevant, depending on the circumstances. Specifically, I found that, particularly in Study 3c and the combined sample, optimism played an important role in whether or not participants displayed

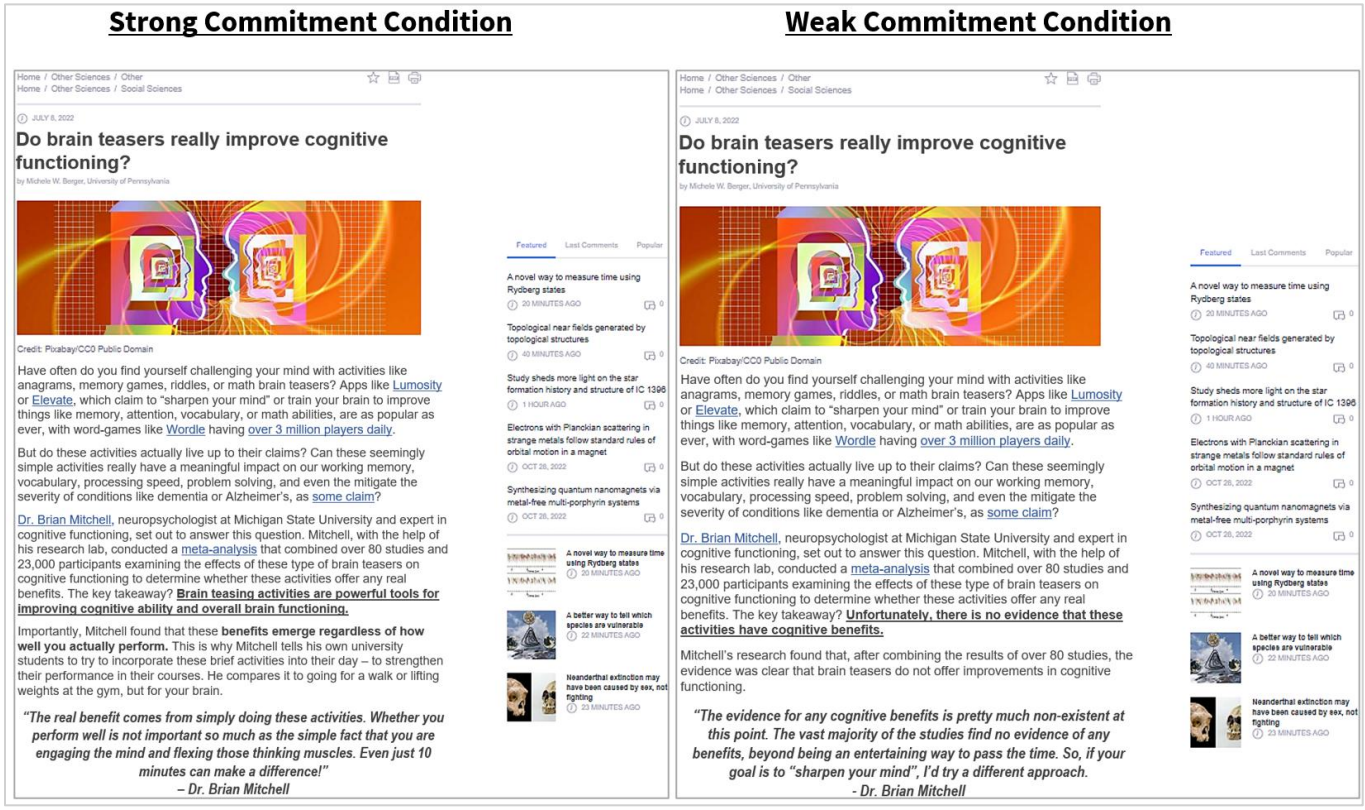
normatively accurate beliefs. Contrary to initial theorizing, there was not robust evidence of a main effect of optimism. Rather, it was when participants were *higher* in optimism that they were more likely to recognize the distinct benefits of to-date and to-go progress framing (i.e., an optimism x commitment interaction). Specifically, these "high optimism" individuals were more likely to choose the to-go worksheet when their goal commitment was higher and rated this worksheet as *more* motivating while also rating the to-date worksheet as *less* motivating. Further, for those who were *lower* in optimism, participants' beliefs reflected either normatively inaccurate effects (i.e., by rating the to-date worksheet as more motivating when commitment was higher), or a lack of awareness of normatively accurate effects (i.e., by showing no significant relationship between commitment and either worksheet choice or the to-go worksheet ratings). It is possible that participants higher in optimism were more engaged, and thus better able to consider how to effectively regulate their motivation. Future work is needed to disentangle whether optimism would typically have this effect, or if this reflects a somewhat idiosyncratic feature of these samples collected during the time of the COVID-19 pandemic, when morale and goal expectancies often tended to be lower (Brooks et al., 2020; Clayton McClure & Cole, 2022; Ritchie et al., 2021).

Appendix G

Study 4 Materials

Figure G

Bogus Psychology Today Articles

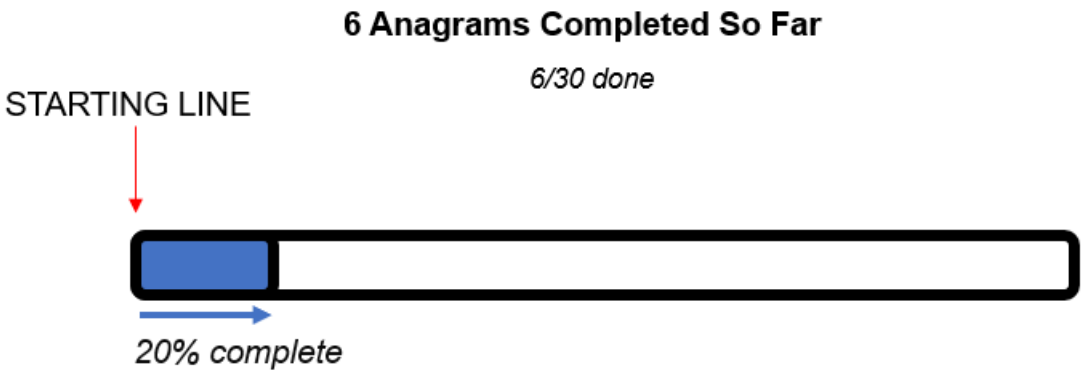


Progress Choice Study Materials

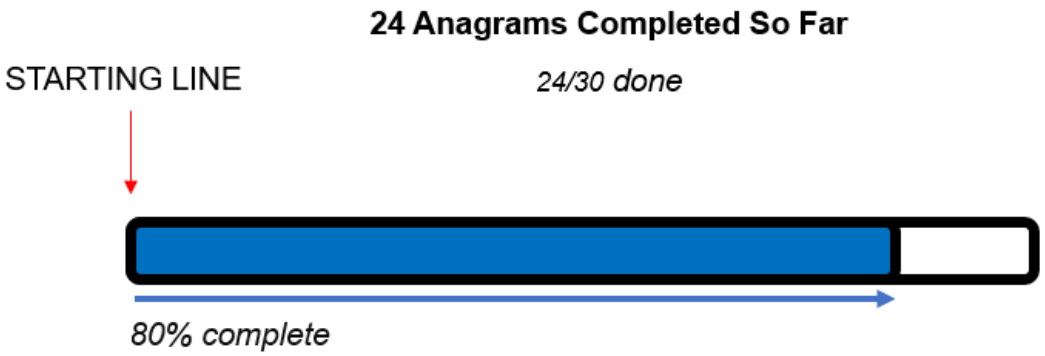
We can track our progress in different ways to motivate ourselves. For this task, you get to choose how you would like to monitor your progress to help you perform better.

To-Date Option (label not visible to participants):

One of the ways we can think about progress is to look back at the starting line and see how far we have come. So, for instance, when you are still early on in the task and have completed 6 of 30 anagrams, you could track your progress by looking back at where you started and think about much you have accomplished so far. For example:

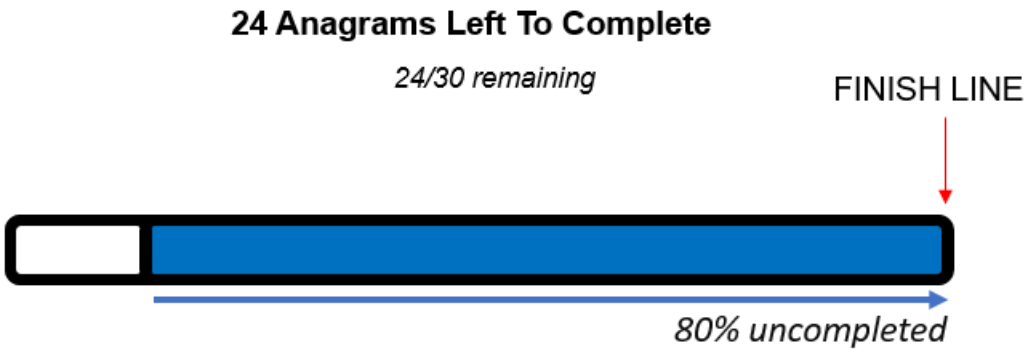


And then later, once you are closer to the end and have completed 24/30 anagrams, tracking your progress by thinking about how much you have completed so far would look like this:

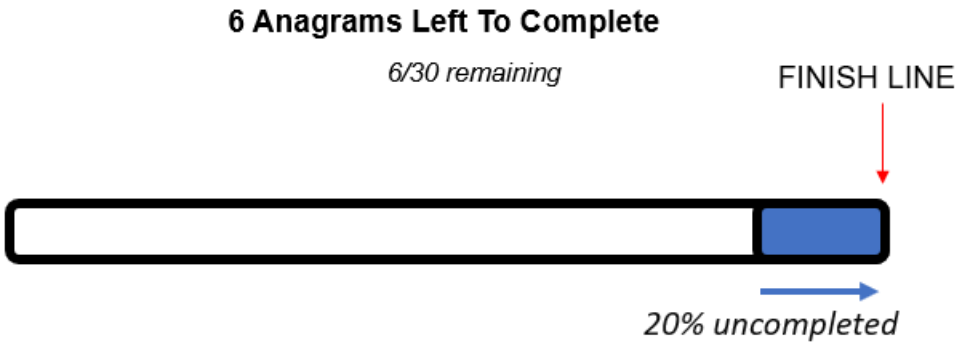


To-Go Option (label not visible to participants):

Another option is to look towards the finish line and think about how much we have left to go. So, if you were still early in the task and still had 24/30 anagrams remaining, you could focus on the finish line and the remaining anagrams that you still need to complete in order to finish the task. For example:



And then later, once you are closer to the end and only have 6 of the 30 anagrams remaining, tracking your progress by thinking about how much you have left to complete would look like this:



Please choose how you would like to monitor your progress during the anagram task to help you stay engaged and perform your best?

- *Option A: Focus on the starting line*
- *Option B: Focus on the finish line*

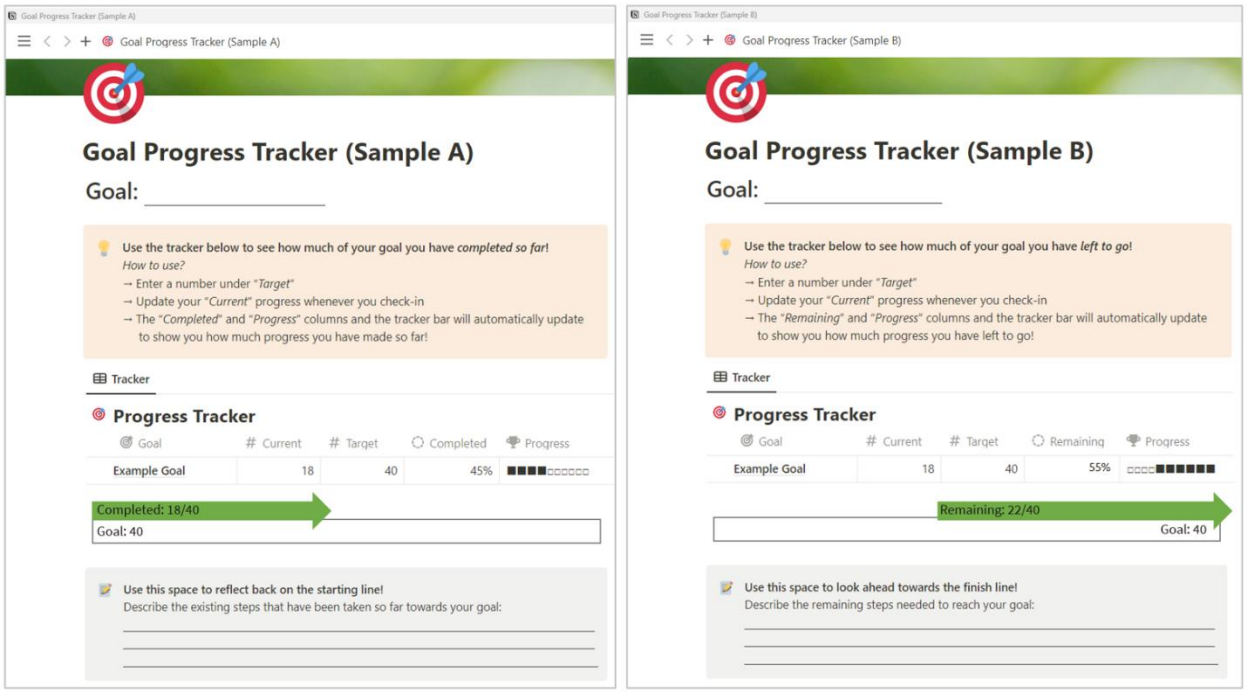
Appendix H

Study 5 Materials and Additional Analyses

Study Materials

Figure H

Progress Trackers: To-Date (Sample A) and To-Go (Sample B)



Planned Contrasts: Strong and Weak Commitment Conditions

As per my analysis plan, I also conducted planned contrasts comparing the strong and weak commitment conditions for all relevant analyses to more directly compare these results to prior studies.

Perceived Commitment Manipulation Check

An independent-samples t-test revealed that participants in the strong commitment condition ($M = 6.40$, $SD = 0.71$) rated the student as significantly more committed than those in the weak commitment condition ($M = 4.08$, $SD = 1.09$), $t(218.52) = 20.38$, $p < .001$, $d = 0.91$.

Progress Tracker: Binary Choice

I conducted a chi-square test of independence to examine the relationship between commitment condition and progress framing choice. The relationship was non-significant, $X^2(1, N = 263) = 0.51$, $p = .525$ (see Table 11 in main text for progress choice frequencies).

Progress Tracker: Continuous Ratings

An independent-samples t-test revealed that there was no significant difference in to-date ratings in the strong ($M = 5.56$, $SD = 1.08$) and weak ($M = 5.37$, $SD = 1.18$) commitment conditions, $t(261) = 1.37$, $p = .172$, $d = 1.13$. However, those in the strong commitment condition ($M = 5.09$, $SD = 1.31$) rated to-go as significantly more motivating for the student than those in the weak commitment condition ($M = 4.60$, $SD = 1.41$), $t(261) = 2.91$, $p = .004$, $d = 1.36$.