

The final publication is available at Elsevier via <http://dx.doi.org/10.1016/bs.adms.2019.10.001>. © 2020. This manuscript version is made available under the CC-BY-NC-ND 4.0 license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Metamotivation: Emerging Research on the Regulation of Motivational States

David B. Miele
Boston College

Abigail A. Scholer
University of Waterloo

Kentaro Fujita
The Ohio State University

Author Note

This work was supported by funding from the Buehler Sesquicentennial Assistant Professorship, the James S. McDonnell Foundation (Collaborative Grant No. 220020483), the National Science Foundation (Grant #1626733), and the Social Sciences and Humanities Research Council of Canada (Grant #435-2017-0184). The opinions expressed here are our own and do not necessarily reflect the views of the funding organizations

Correspondence concerning this article should be addressed to David B. Miele, Department of Counseling, Developmental, and Educational Psychology, Boston College, Chestnut Hill, MA 02467. Email: d.miele@bc.edu

Table of Contents

Abstract	3
Introduction	4
Historical Foundations	5
Metamotivational Framework	10
Motivational Trade-offs.....	11
Metamotivational Knowledge.....	13
Empirical Studies of Metamotivational Knowledge	15
Metamotivational Knowledge About Promotion and Prevention Motivations.....	15
Initial studies.	16
Do individual difference in metamotivational knowledge predict achievement?	18
Are metamotivational beliefs about promotion and prevention motivations culturally bound?.....	20
Metamotivational Knowledge About Autonomous and Controlled Motivations	21
Metamotivational Knowledge About High- and Low-Level Construal	25
Implications	31
Advancing Motivation Science Research	31
Knowledge as a Source of Self-Regulatory Success vs. Failure	32
The Centrality of Flexibility	34
Future Directions	35
Predicting Real-World Outcomes	35
Self-Knowledge.....	37
Creating Fit.....	39
Development and Acquisition of Knowledge.....	41
Linking Metamotivation to General Motivational Competency	44
Toward a Comprehensive Mechanistic Model of Metamotivation.....	45
Summary	47
References	49

Abstract

Until recently, research examining the self-regulation of motivation focused primarily on the strategies people use to bolster the amount of motivation they have for pursuing a task goal. In contrast, our metamotivational framework highlights the importance of also examining if people recognize which qualitatively distinct types of motivation (e.g., promotion vs. prevention) are most helpful for achieving their goal, given the demands of the task or situation. At the heart of this framework is the idea that any given motivational state involves performance tradeoffs, such that it may be relatively beneficial for some tasks, but detrimental for others. In this piece, we review research suggesting that, on average, people (a) possess metamotivational knowledge of such tradeoffs (particularly those posited by regulatory focus theory, self-determination theory, and construal level theory), (b) recognize strategies that could be used to induce adaptive motivational states, and (c) implement this knowledge (at times) to increase the likelihood of performance success. We also discuss future directions for metamotivation research, including whether and when individual differences in metamotivational knowledge predict real-world outcomes, how such metamotivational knowledge develops, and whether there is a general metamotivational competency that predicts people's sensitivity to a broad range of motivationally-relevant performance tradeoffs.

Word count: 200

Keywords: metamotivation, self-regulation, self-control, regulatory focus, construal level, intrinsic motivation, metacognition

Metamotivation: Emerging Research on the Regulation of Motivational States

Over the past century, motivation research has identified numerous contextual and dispositional factors that influence people's motivation to pursue important goals across a number of domains, including school, work, health, and romantic relationships. However, in much of this work, a primary assumption is that people are passively shaped by these factors. In fact, surprisingly little research has explored the ways in which individuals actively modulate and shift their *own* motivational states. One potential explanation for why researchers have tended to overlook the agentic role of individuals in regulating their own motivation pertains to the ways in which these researchers have characterized motivation in their work. That is, thinking of motivation as an underlying force, as a set of inputs for rational choice, or as an attributional response to the behavior of others (see Weiner, 1991) may lead researchers to view motivational states in a deterministic manner and to assume implicitly that there is not much that people can do to change them.

Regardless of why researchers have tended to overlook motivation regulation as a topic of investigation, the little work that has been conducted on this topic suggests that people *can* be effective at regulating their own motivation. That is, some individuals possess strategies for enhancing particular types of motivational states (see Wolters, 2003) and these strategies can bolster their task engagement and performance (e.g., Schwinger & Stiensmeier-Pelster, 2012). However, at this point, we understand relatively little about how and when people come to realize that they should attempt to regulate their motivation or how they decide which strategies to use. Thus, to develop a more comprehensive understanding of how people regulate their motivation and how this regulation contributes to well-being and success across a broad number

of domains, we argue that researchers should begin to investigate more thoroughly the ways in which people think about, assess, and modulate their own motivational states.

To aid researchers in this endeavor, this paper describes a *metamotivational* approach to investigating motivation regulation. By “metamotivation,” we mean the processes and knowledge involved in regulating one’s own motivational states. Drawing from the literatures on metacognition and behavioral self-regulation (Carver & Scheier, 1998; Nelson & Narens, 1990), we conceptualize metamotivation as consisting of two reciprocal processes. The first process, which we refer to as *metamotivational monitoring*, involves assessing both the quantity and quality of one’s motivation to pursue a particular goal. The second process, which we refer to as *metamotivational control*, involves using the output of the monitoring process to select and execute strategies for bolstering or maintaining particular motivational states. Importantly, we argue that the effectiveness of both processes depends, in part, on one’s beliefs about how motivation functions and how it can be changed (i.e., one’s *metamotivational knowledge*; Scholer & Miele 2016; Miele & Scholer 2018; Scholer, Miele, Murayama, and Fujita, 2018).

In what follows, we describe our metamotivational approach to studying motivation regulation in more detail, starting with a discussion of the historical antecedents of this approach. We then go on to describe some of the key tenets of the framework that we have developed for studying metamotivation, as well as to review recent research that has been guided by this framework. Finally, we conclude by discussing the practical implications of this research and by considering some future directions for the emerging field of metamotivation.

Historical Foundations

Our metamotivational approach to investigating motivation regulation is rooted in prior work on volition, metacognition, and emotion regulation. Theorizing about volition dates back

hundreds of years (see Hilgard, 1980), and was taken up as topic of empirical investigation early last century by psychologists such as Narciss Ach. According to Ach, the role of volition in the motivational system is to ensure that one's goal or intention is not abandoned in order to pursue some competing impulse or motive (see Kuhl & Beckmann, 1985). This conception of volition was reintroduced to the psychological literature by Heckhausen (1991) and Kuhl (1984, 1985) toward the end of the last century. Although many researchers may consider volition to be a component of motivation, Kuhl's (1984) theory of action control treats these constructs as distinct and non-overlapping. For Kuhl, motivation encompasses the processes by which individuals weigh expectancies and values in order to decide what action to engage in (i.e., goal selection and intention formation), whereas volition refers to the processes that ensure that individuals will act on their intentions in the face of competing impulses or tendencies and carry out these actions until their goals are completed.

An important aspect of Kuhl's theory is its specification of six kinds of strategies that people use to exert volitional control, including strategies that target attention, emotion, motivation, and the environment – a list that was later expanded and organized into a hierarchical taxonomy by Corno (1989, 2001). These strategies have, for the most part, been empirically investigated as part of two separate, but overlapping literatures: the motivation regulation literature from within educational psychology and the self-control literature within social psychology. Whereas the motivation regulation literature has tended to focus on strategies that students use to directly target their motivation in response to a broad range of motivational challenges, the self-control literature has tended to focus on a broader range of volitional strategies applied to a specific challenge (i.e., pursuing an important goal in the face of competing impulses and temptations).

The motivation regulation literature draws on social cognitive theories of self-regulated learning (see Wolters, 2003) and focuses primarily on the strategies that students use to maintain or bolster their task motivation in response to a variety of obstacles or challenges, such as trying to study material that seems uninteresting or unimportant (Sansone & Thoman, 2005, 2006; Schwinger & Stiensmeier-Pelster, 2012; Wolters, 2003, 2011). Much of this literature is based on seminal work by Sansone (Sansone, Weir, Harpster, & Morgan, 1992) and Wolters (1998). Sansone and her colleagues observed that when asked to complete a monotonous matrix copying task, participants exhibited a number of behaviors that appeared to be aimed at making the task more engaging, such as varying their handwriting when inputting letters/words (Sansone et al., 1992; Sansone, Weibe, & Morgan, 1999). Notably, although these behaviors led participants to persist longer when the time for completing the task was open-ended (Sansone et al., 1999), they led to poorer performance (i.e., copying fewer letters) when time was limited (Sansone et al., 1992; see also Smith, Wagaman, & Handley, 2009). This highlights an important insight about motivational trade-offs – although these behaviors enhanced interest, they also slowed participants down; thus, depending on how performance was assessed, the same strategy could facilitate or hinder achievement.

Whereas Sansone's work highlights how people attempt to regulate interest and the consequences of this regulation for performance, Wolters's work (2003, 2011) examines how students think about managing their motivation more broadly and catalogues the strategies they report using in response to a variety of motivational problems. Initially, Wolters (1998) asked students to imagine encountering a particular motivational problem while studying (e.g., boring material) and to then describe what they would do in order to keep themselves motivated. Wolters then reviewed the students' responses and identified fourteen categories, many of which

represent strategies for targeting particular motivational constructs (e.g., efficacy, mastery goals, interest, etc.). These categories served as the basis for a questionnaire measure of students' strategies that has been refined over the past two decades and which now includes six to eight broad categories (depending on the version; Schwinger, Steinmayr, & Spinath, 2009; Wolters & Benzon, 2013; cf. Kim, Brady, & Wolters, 2018). A number of studies have examined the extent to which the types of strategies assessed by such questionnaires are associated with a range of motivational, cognitive, and metacognitive variables, as well as with students' academic achievement (e.g., Eckerlein et al., 2019; Grunschel, Schwinger, Steinmayr, & Fries, 2016; Ljubin-Golub, Petricevic, & Rován, 2019; Schwinger & Otterpohl, 2017; Schwinger & Stiensmeier-Pelster, 2012; Wolters & Benzon, 2013; Wolters & Rosenthal, 2000). Some of this work suggests that certain strategies (e.g., mastery self-talk) may work better than others in certain situations. However, there is still much to learn about the effectiveness of these strategies across a wide variety of contexts.

In contrast to the work on self-regulated learning, which has focused on how people respond to a variety of motivational problems, the self-control literature within social psychology has examined a broad range of volitional strategies (i.e., strategies targeting beliefs, emotions, attention, and motivation) in response to a *specific* type of motivational problem. As Fujita (2011) explains, this type of problem generally involves wanting to prioritize an abstract, distal motivation over a competing concrete, proximal motivation. A classic example of this kind of dual-motive conflict can be found in Mischel and colleagues' work on delay-of-gratification in children (see Mischel, Shoda, & Rodriguez, 1989, for a review). In these studies, children of varying ages were promised a large reward (e.g., two marshmallows) if they could wait for a relatively long period (e.g., 15 minutes) without consuming a smaller reward (e.g., a single

marshmallow) that was placed in front of them. Whereas 3-year old children struggled, 5-year old children were increasingly able to delay gratification. Subsequent research revealed that these age-related differences may be due to differences in children's knowledge of various strategies for "cooling" any impulsive "hot" cognitions (Mischel & Mischel, 1983). For example, whereas 3-year old children mistakenly believed that attending to the immediate reward would assist in delay of gratification, 5-year old children increasingly understood the benefits of looking away and distracting themselves. Later research revealed that individual differences in this sort of knowledge also predicted behavioral misconduct among older children with social adjustment problems (Rodriguez, Mischel, & Shoda, 1989).

Traditionally, the "cooling" strategies used by the children in these studies have been interpreted as examples of cognitive control (Mischel & Mischel, 1983). However, these strategies (along with other self-control techniques that directly target cognitive states/processes) can also be viewed as indirectly contributing to motivation regulation to the extent that they involve deliberately disregarding "information that increases the motivation underlying... competing tendencies" (Kuhl, 1984, p. 183). Furthermore, by dampening or inhibiting the motivation associated with a proximal competing goal, these strategies might also serve to preserve or even bolster the motivation associated with the distal goal (Fishbach, Zhang, & Trope, 2010). Thus, although self-control research has typically not been framed in terms of motivation regulation, much of the work in this literature is relevant for understanding how people regulate their task motivation when faced with a competing impulse or temptation.

Despite some clear differences in the ways that studies from the educational and social psychological literatures have investigated the topic of motivation regulation, there are some important commonalities. First, both literatures have primarily focused on identifying the

strategies that people use to overcome motivational problems and then assessing their effectiveness (i.e., metamotivational control). Second, the types of motivational problems that these studies have examined generally involve perceived deficits in the quantity or amount of one's task motivation. In contrast to this work, the metamotivational approach to motivation regulation that we discuss in the next section places a strong emphasis on investigating the ways in which people become aware of a particular motivational problem and then decide which strategies would be most effective for addressing this problem (i.e., metamotivational monitoring). The metamotivational approach also stresses the importance of examining motivational problems that involve a perceived mismatch between the type of motivation one is experiencing and the processing demands of the task at hand (i.e., problems of motivational quality rather than quantity).

Metamotivational Framework

In this section, we briefly review some of the key tenets of our metamotivational framework; for a more detailed description, see Miele and Scholer (2018) and Scholer and Miele (2016). At the core of our framework is the idea that people monitor both the quantity and quality of their motivation. By “quantity” we mean the extent to which an individual desires to engage in a particular activity or task. Thus, our framework attempts to explain how it is that people become aware that this desire is waning and that they are in danger of quitting the task prematurely or of not putting in the level of effort needed to achieve their goal. In contrast, we use the word “quality” to refer to distinct types of motivation (e.g., intrinsic vs. extrinsic, promotion vs. prevention) that vary in terms of how they are subjectively experienced and in the kinds of consequences they have for goal pursuit and performance (see Miele & Wigfield, 2014; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009). Thus, an additional aim of our

framework is to explain how people come to realize that they are not “motivated in the right way” for a given task, even when they happen to believe that they are “motivated enough.” Much of the research to-date testing our metamotivational framework has focused on regulation of motivation quality rather than quantity. This is largely because a focus on motivation quality is a particularly novel aspect of the framework. We have provided a more complete analysis of how people might regulate both the quantity and quality of motivation in other work (Miele & Scholer, 2018); however, in what follows, we focus on the latter in order to adhere more closely to empirical findings.

Motivational Trade-offs

The idea that there is a “right” or appropriate type of motivation for certain tasks is based on the assumption that tasks and situations differ in their motivational demands or affordances. That is, any given motivational state involves trade-offs—it will be beneficial in some circumstances, harmful in others, and irrelevant in yet other situations (e.g., Sansone, 2009; Scholer & Higgins, 2012). This assumption is consistent with arguments that have been made in the literatures on coping and emotion regulation. For instance, (Bonanno & Burton, 2013) argued that researchers have often fallen prey to a *fallacy of uniform efficacy*, assuming that certain emotion regulation strategies (e.g., reappraisal) are universally beneficial whereas others (e.g., suppression) are universally maladaptive.

However, increasing evidence suggests that the ability to shift between emotion regulation strategies—emotion regulation flexibility—is more critical for well-being than simply being skilled at reappraisal (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004; Cheng, 2003a; Chiu, Hong, Mischel, & Shoda, 1995; Kobylińska & Kusev, 2019). For example, although frequent exposure to trauma often increases the incidence of posttraumatic stress

disorder (PTSD), the ability to flexibly regulate one's emotions moderates this link: Firefighters who scored high on a performance measure of emotion regulation flexibility showed no association between trauma exposure and PTSD, whereas firefighters who scored low on this measure exhibited a positive association between trauma exposure and PTSD (Levy-Gigi et al., 2016). Coping flexibility—the appropriate endorsement of distinct coping strategies (e.g., active vs. avoidant strategies) in confronting controllable versus uncontrollable stressful situations—also leads to better psychological adjustment (Cheng, 2003b, 2003a; Cheng et al., 2012; Cheng, Chiu, Hong, & Cheung, 2001; Cheng, Lau, & Chan, 2014; Chiu et al., 1995).

Similarly, research in motivation science reveals that there are context-specific trade-offs for qualitatively distinct motivation states. Regulatory focus theory (Higgins, 1997), for example, posits two fundamental yet qualitatively distinct motivational orientations. People who pursue goals with a *promotion focus* are generally concerned with fulfilling their need for growth and, thus, value these goals as ideals that they hope to attain. In order to achieve their ideals, promotion-focused individuals tend to adopt eager strategies, which involve seeking opportunities for gain and processing information in an associative, divergent, and flexible manner. People who pursue goals with a *prevention focus*, by contrast, are more concerned with fulfilling their need for safety and security and, thus, value these goals as responsibilities or duties that they feel obligated to fulfill. In order to uphold their responsibilities, prevention-focused individuals tend to adopt vigilant strategies, which involve protecting against potential threats and processing information in an analytic, convergent, and careful manner (Scholer & Higgins, 2012).

Importantly, research suggests that people perform well when their current motivational orientation is aligned with the processing demands of the task at hand (i.e., when they experience

task-motivation fit). For example, research suggests that individuals motivated by promotion concerns generally perform well on creativity tasks – tasks that demand associative and divergent thinking (e.g., Bittner, Bruena, & Rietzschel, 2016; Friedman & Förster, 2001)—though there are circumstances when prevention-focused individuals also behave creatively (e.g., Baas, De Dreu, & Nijstad, 2011). By contrast, individuals motivated by prevention concerns should generally perform well on tasks that demand careful processing and convergent thinking (e.g., certain types of logic problems; Seibt & Förster, 2004).

In contrast to past research in which task-motivation fit was experimentally created by researchers, the metamotivation framework proposes that people can strategically create this fit themselves to promote goal-directed outcomes. That is, when people understand the affordances of different motivational states and are sensitive to the processing demands of different tasks, they are able to shift themselves into promotion vs. prevention orientations in order to perform tasks that require divergent vs. convergent processing, respectively. People’s flexible modulation of their motivational states in the service of establishing task-motivation fit is the essence of what it means to regulate the quality of one’s motivation.

Metamotivational Knowledge

Whether or not individuals are successful at regulating the quality of their motivation should depend in part on whether they possess accurate beliefs about how motivation functions (i.e., metamotivational knowledge). Borrowing from research on metacognition (see Flavell, 1979; Pintrich, 2002; Wolters, 2003), our framework posits three general categories of metamotivational knowledge. *Strategy knowledge* encompasses people’s understanding of the kinds of strategies they can use to bolster specific aspects of their motivation and to induce particular types of motivational states. Until recently, most of the motivation regulation research

in both educational and social psychology focused on assessing this knowledge and examining the kinds of outcomes it predicts (see Miele & Scholer, 2018; Mischel & Mischel, 1983; Rodriguez, Mischel, & Shoda, 1989; Trope & Fishbach, 2000; Wolters, 2003). Less frequently studied, but equally important, is people's metamotivational *task knowledge*, which includes their beliefs about which motivational states are most beneficial for performance on a particular type of task. Finally, *self-knowledge* refers to people's understanding of what it feels like to experience particular types of motivational states and their sense of efficacy for being able to modulate or sustain these states.

Our own metamotivation research, which we review in the next section, has primarily focused on assessing whether people possess the task and strategy knowledge needed to successfully regulate the quality of their motivation. More specifically, we are interested in whether people are generally aware of the trade-offs associated with different types of motivations and mindsets (promotion vs. prevention, autonomy vs. control, high- vs low-level construal) and whether they have a sense of the strategies they can use to take advantage of these trade-offs and maximize performance across a broad range of contexts and tasks. We are also interested in whether individual differences in this knowledge of task-motivation fit predict motivationally flexible behavior and important life outcomes (e.g., academic achievement, health, well-being) over time.

Finally, it is important to note that research on metamotivation has generally assumed that the task and strategy knowledge people possess may be tacit or implicit (e.g., Reber, 1989; Wagner & Sternberg, 1985). The paradigm that we typically use to assess metamotivational knowledge accounts for this possibility by presenting participants with scenarios or tasks that vary in terms of their motivational demands and then asking them to indicate what type of

motivation-inducing activity they would prefer to engage in before each task or which activity would lead them to perform optimally on the task (e.g., MacGregor et al., 2017; Nguyen, Carnevale, Scholer, Miele, & Fujita, 2019; Scholer & Miele, 2016). Participants who demonstrate an understanding of task-motivation fit seem to intuitively know which activities fit with which tasks, even when they are not aware that they possess this knowledge or are unable to explicitly articulate it. This does not preclude the possibility that some particularly insightful individuals are able to explicitly articulate their metamotivational knowledge; we simply adopt methods that do not require participants to possess this ability in order to demonstrate their knowledge.

Empirical Studies of Metamotivational Knowledge

Research that we have conducted examining people's metamotivational knowledge of task-motivation fit has thus far drawn on three prominent traditions within motivation science—regulatory focus theory (Higgins, 1997), self-determination theory (Deci & Ryan, 2000), and construal level theory (Liberman & Trope, 2008; Trope & Liberman, 2000). In the sections below, we review the sets of studies we have conducted that align with each of these theories.

Metamotivational Knowledge About Promotion and Prevention Motivations

As discussed earlier in the piece, whether it is better to be promotion- or prevention-focused depends on the nature of the task. Situations that are typically best performed with promotion motivation may be characterized by one or all of the following: associative, divergent, and flexible thinking (e.g., a creative brainstorming task; Friedman & Förster, 2001); a focus on the abstract or big picture (e.g., developing a company's vision statement; Förster & Higgins, 2005); incentive structures in which gains are prevalent and rewarded (e.g., bonuses based on bigger-than-expected profits; Higgins, Shah, & Friedman, 1997); and times when leisure or

indulgence is the primary goal (e.g., a relaxing vacation; Dholakia, Gopinath, Bagozzi, & Natarajan, 2006). In contrast, situations that are typically best performed with prevention motivation are characterized by convergent thinking (e.g., certain types of logic problems; Seibt & Förster, 2004); a focus on concrete details (e.g., quality control inspections; Semin et al., 2005); incentive structures in which potential losses are prevalent and costly (e.g., military surveillance; Higgins et al., 1997); and times when lapses in attention are problematic (e.g., avoiding temptations; Freitas, Liberman, & Higgins, 2002).

From a metamotivational perspective, this suggests that people can establish task-motivation fit by upregulating or maintaining promotion motivation when presented with tasks and situations in which performance benefits from eager strategies, and by upregulating or maintaining prevention motivation when presented with tasks in which performance benefits from vigilant strategies. Thus, from a regulatory focus perspective, creation of task-motivation fit requires people to (a) recognize when tasks demand eagerness versus vigilance (task knowledge), (b) identify strategies that induce promotion versus prevention (strategy knowledge), and (c) select the strategy that targets the appropriate motivation and best promotes performance on the anticipated task.

Initial studies. To assess whether people possess this metamotivational knowledge, our initial research employed the paradigm briefly described in the previous section, which we adapted from studies examining people's understanding of instrumental emotion regulation (Ford & Tamir, 2012; Tamir, 2009; Tamir & Ford, 2012; Tamir, Mitchell, & Gross, 2008). Specifically, participants were presented with descriptions of tasks (e.g., brainstorming, proofreading) that theory and prior research suggest are performed best with eager or vigilant processing strategies. Participants were also presented with activities or incentive structures that

prior work has shown can induce promotion or prevention motivations (e.g., "recall your childhood aspirations" to induce promotion or "recall your childhood duties" to induce prevention), as well as with neutral activities (e.g., "recall your route to school this morning"). For each task-strategy combination, participants were asked to indicate how well they thought they would perform on these tasks when first engaging in a given activity or when operating under a particular incentive structure (e.g., gaining points for correct responses vs. losing points for incorrect responses). In some cases, they were also asked how much they preferred to engage in a particular activity.

Across five studies, Scholer and Miele (2016) found that North American participants exhibited accurate knowledge regarding task-motivation fit, such that they generally believed that prevention-inducing recall strategies would lead to better performance for vigilant versus eager tasks and at times recognized that promotion-inducing recall strategies would lead to better performance for eager versus vigilant tasks (participants' expectations for neutral strategies did not differ as a function of task). However, there was a good deal of variability in the accuracy of these beliefs, suggesting individual differences in this metamotivational knowledge. In addition, although there was evidence that participants had knowledge of task-motivation fit, there was also a strong main effect of activity type, such that participants tended to endorse the general utility of promotion states over prevention states. Indeed, when participants had to make a consequential behavioral choice in two of the studies, participants overwhelmingly chose the promotion-inducing activity or incentive structure.

Given this tension between participants' awareness of task-motivation fit and their general preference for promotion motivation, Scholer and Miele (2016) posited that the structure of the decision might influence the impact of participants' metamotivational knowledge on their

consequential choices. The paradigm described thus far required participants to select a motivation-inducing strategy in order to prepare for an upcoming task; however, another type of self-regulatory challenge that people face is what task to engage in given a particular motivational state (e.g., I am feeling particularly eager and enthusiastic right now, so what task should I do first?). Scholer and Miele (Study 5) explored whether this latter type of decision structure might result in a choice pattern that is more consistent with participants' understanding of task-motivation fit. As predicted, when participants were presented with a prevention-inducing preparatory activity and asked to choose a task to engage in after this activity (with the goal of maximizing performance), they were more likely to choose the task that required vigilant processing than the task that required eager processing. However, when participants were presented with a promotion-inducing activity, there was no difference in their likelihood of choosing a vigilant versus eager task.

Do individual difference in metamotivational knowledge predict achievement? This initial investigation of metamotivational knowledge suggested that, in many ways, people were remarkably sensitive to task-motivation fit, both in their recognition of what types of motivational states are optimal for a given task and what strategies can be used to induce these states. However, there was significant variation in this knowledge, and preliminary evidence from a pair of recent studies suggests that this variability can predict performance (Ross, Nguyen, Scholer, Fujita, & Miele, 2019). In a field study, participants completed a regulatory focus knowledge assessment (based on the paradigm from our previous studies) at the beginning of the academic term. Differences in metamotivational knowledge about regulatory focus predicted grades at the end of the term. A second two-part study found a similar pattern of results. Participants completed the regulatory focus knowledge measure in Session 1; and, in a

second session, they were randomly assigned to complete either a creative brainstorming task or a proofreading task. As in the field study, regulatory focus metamotivational knowledge predicted performance on both of these tasks, even when controlling for task enjoyment, difficulty, and prior experience.

Initial investigations also suggest that people appear to have accurate metamotivational knowledge about how to manage the promotion and prevention motivations of others. Specifically, Jansen, Moore, Scholer, Fujita, and Miele (2019) found that managers were more likely to select a promotion-focused employee (e.g., “Ellen has accomplished a lot in her time with the company, and can always be relied upon to spot new opportunities for company growth....She would like to one day lead the company to fulfill her dream of running a business”) for tasks that require eager processing (e.g., developing an innovative advertising campaign), but were more likely to select a prevention-focused employee (e.g., "Victoria has high standards that are in line with company values, and can always be relied upon to uphold company policy...She would like to one day lead the company so she can ensure financial stability for the company") for tasks that require vigilant processing (e.g., editing and reviewing advertisements to ensure they meet advertising regulations). Further, managers also exhibited accurate knowledge of task-motivation fit when selecting the strategies that they thought they could use to motivate employees for particular kinds of tasks. For example, managers recognized that praising employee accomplishment and progress (a promotion-inducing strategy) would lead employees to perform better when engaged in eagerness tasks, but that reminding employees to follow company rules and regulations (a prevention-inducing strategy) would lead employees to perform better when engaged in vigilance tasks. In addition, managers not only recognized the effectiveness of these strategies, but spontaneously generated such strategies when actually

trying to motivate a subordinate in an experimental paradigm. Later in the piece, we discuss the potential of our metamotivational approach for generating new insights into the management of others' motivations.

Are metamotivational beliefs about promotion and prevention motivations culturally bound? As previously mentioned, our initial investigations of metamotivational knowledge (Scholer & Miele, 2016) suggested that participants might have biased expectations in favor of promotion-inducing strategies. We initially posited that this bias might have a cultural basis. The original studies were conducted in the United States and Canada and prior work has shown that North American participants tend to be predominantly promotion focused; further, this tends to be a cultural context in which "being motivated" is often equated with being pumped up, eager, and enthusiastic. We speculated that the bias might be eliminated or even reversed in countries where people tend to be more prevention focused, such as Japan (Higgins, 2008).

However, our recent cross-cultural examination of this possibility suggests that the story is not so simple (Nguyen, Togawa, Miele, Scholer, & Fujita, 2019). Japanese participants, presented with the same materials as those in Scholer and Miele (2016), also showed a bias toward promotion-inducing strategies. Additional studies suggest that this bias may actually vary more as a function of people's ability to detect the motivational affordances of a given task. As we discuss in more detail later in the piece, it is possible that some tasks, situations, and strategies vary in the strength of signals they convey about motivational states. For example, although a challenging proofreading task is optimally performed with a vigilant strategy, this task may not call for as much vigilance as an air traffic control simulation does. In one case, a

comma may be missed; in another, a plane may crash. Similarly, some strategies may be more clearly linked to a given motivational state than others.

It is important to note that, regardless of signal strength, the materials that we used in our original studies focused on strategies participants could use to motivate themselves in an independent manner (i.e., what can I do on my own to motivate myself?). As mentioned above, these materials did not reveal any differences in the metamotivational beliefs of Japanese and American participants. However, when we presented people with materials that focused on strategies that they could use to motivate themselves in a more interdependent manner (e.g., what can I do for someone else in order to motivate myself?), cross-cultural differences did emerge (Nguyen, Togawa, Miele, et al., 2019). Specifically, when the means to induce a given motivational state directly affected the outcomes of others (e.g., if I perform well, my friend will gain versus lose money), Japanese participants were more sensitive to task-motivation fit than American participants. In sum, it appeared that Japanese participants had more tools at their disposal for creating task-motivation fit (i.e., they believed they could draw on a variety of independent *and* interdependent strategies).

Metamotivational Knowledge About Autonomous and Controlled Motivations

Another well-established way of categorizing and conceptualizing distinct motivations is on the basis of the autonomy-control continuum specified by self-determination theory (Deci & Ryan, 2000). At one end of the continuum is the interest and enjoyment that individuals associate with engaging in the task (i.e., *intrinsic value*). At the other end of the continuum is the extent to which individuals feel compelled to engage in the task because of some external force, such as perceived rewards or punishments (i.e., *external value*). Finally, in the middle of the continuum is the degree to which individuals value the task because they perceive it to be personally

relevant or aligned with some aspect of their identity (i.e., *self-relevant value*). Importantly, what we refer to as “self-relevant value” is comparable to the two autonomous types of regulation posited by self-determination theory (i.e., identified and integrated regulation), whereas “external value” roughly corresponds to the two controlled types of extrinsic regulation (i.e., external and introjected regulation). Thus, although self-relevant value is in the middle of the continuum, it is expected to elicit an autonomous form of motivation that is qualitatively more similar to intrinsic motivation than to the controlled form of motivation elicited by external value.

Few would dispute that autonomous forms of motivation are beneficial in many situations. For instance, autonomous (relative to controlled) motivation is typically associated with increased persistence (Thoman, Smith, & Silvia, 2011) and greater psychological well-being (Deci & Ryan, 2012). However, research suggests that using extrinsic incentives to increase controlled motivation can lead to enhanced performance on tasks that have strictly defined performance criteria and that demand a certain quantity of output (i.e., on *close-ended tasks*; e.g., Cerasoli et al., 2014; Kruglanski, Friedman, & Zeevi, 1971; Wimperis & Farr, 1979). These tasks tend not to require high absorption or intricacy, but instead involve structured and often speeded responses; they are typically evaluated based on the number of units produced, such as answering multiple choice questions, copying number matrices, or detecting in-text errors while proofreading. In contrast, research suggests that increasing autonomous forms of motivation enhance performance on tasks that have broader, quality-based performance criteria (i.e., on *open-ended tasks*; e.g., Cerasoli et al., 2014; Kruglanski et al., 1971). Such tasks typically require high levels of task-absorption and complex skill demonstration, as well as greater personal involvement. In addition, they are typically evaluated by comparing

performance to a standard that is separate from the quantity produced, such as the depth of one's response to an essay question on an exam or the creativity of one's problem solution.

In order to examine whether people are sensitive to the performance trade-offs that exist between autonomous and controlled forms of motivation, we employed the same types of paradigm used in the earlier studies on promotion and prevention motivations. Specifically, Edwards, Hubley, Scholer, and Miele (2019) presented participants with descriptions of open-ended tasks (e.g., developing an engaging presentation on a topic of your choice) and close-ended tasks (e.g., copying a series of letter matrices as quickly and accurately as possible) and, for each of them, asked participants to rate how helpful eight different motivation-enhancing strategies would be for motivating them on the task. In particular, two of the strategies targeted intrinsic value and were thought to enhance intrinsic motivation (e.g., "Consider the aspects of the task that make it interesting"), two targeted self-relevant value and were thought to enhance an autonomous form of extrinsic motivation (e.g., "Consider the aspects of the task that make it important to you"), two targeted external value and were thought to enhance a controlled form of extrinsic motivation (e.g., "Consider the rewards you might receive from completing this task"), and two were designed to be neutral (e.g., "Count to 10 before starting the task").

Consistent with our previous work, the results of the study showed that participants did possess knowledge of task-motivation fit in this domain. On average, participants reported that strategies targeting external value would be more helpful than strategies targeting intrinsic value for close-ended tasks, but that strategies targeting intrinsic value would be more helpful for open-ended tasks. Interestingly, the perceived utility of the strategies targeting self-relevant value fell somewhere in between the perceived utility of the other two types of strategies for both

kinds of tasks, though (overall) participants tended to find the self-relevant strategies more helpful for the open-ended tasks than for the close-ended tasks.

A similar pattern of results was observed in a subsequent study where, as opposed to being presented with distinct tasks, participants were given a single task that was framed as open-ended or close-ended based on how performance was to be assessed (i.e., “focus on analyzing the validity of the arguments in this text, while ignoring any spelling or grammatical errors” vs. “focus on identifying spelling and grammatical errors in this text, while ignoring the ideas that are expressed”). That is, participants who were asked to imagine the open-ended version of the task rated the strategies targeting intrinsic and self-relevant value as more helpful than did the participants who imagined the close-ended version. In contrast, there was no significant difference between conditions in participants’ ratings of the strategies targeting extrinsic value; though participants in the close-ended condition did rate the strategies targeting extrinsic value as more helpful than the strategies targeting intrinsic and self-relevant value. Participants in the open-ended condition did not view the three types of strategies as differing in helpfulness. Because only the focus of the task varied between conditions in this study, these findings provide strong support for the idea that people are sensitive to the fit between particular types of motivation and the *processing demands* of certain tasks (rather than perceiving a match between the motivations and some other aspect of the tasks).

Finally, in another study by Edwards et al. (2019), participants’ knowledge of task-motivation fit was shown to predict their choices of which motivation-inducing preparatory activities to engage in before two different tasks (with the expectation that they may be asked to perform one of the tasks). For the open-ended task, participants chose the activity targeting intrinsic value significantly more often (62.5%) than the activity targeting extrinsic value

(37.5%). In contrast, for the close-ended task, the pattern was reversed (46.4% vs. 53.6%); though this was not significantly different from chance. Thus, it appears that people are not only aware of the performance trade-offs associated with autonomous and controlled forms of motivation, but that this awareness can influence their attempts to regulate their motivation and maximize their performance.

It is particularly interesting that participants appear to have knowledge of task-motivation fit in this domain given other work illustrating the biases people often hold about some of these strategies. For example, relative to other types of strategies (such as rewarding oneself), participants in a study by Sansone et al. (1992) believed that interest-enhancing strategies would be particularly effective in getting them to perform three different types of activities on a regular basis. At the same time, people often fail to recognize how extrinsic rewards can actually hurt intrinsic motivation (Murayama, Kitagami, Tanaka, & Raw, 2016) and do not seem to realize just how motivating intrinsic motivation can actually be (Woolley & Fishbach, 2015). Thus, an important direction for future research is to explore of how general beliefs about intrinsic and extrinsic motivation influence people's metamotivational understanding of task-motivation fit in this domain.

Metamotivational Knowledge About High- and Low-Level Construal

It is well understood that people's motivations and goals are hierarchically structured (see Carver & Scheier, 1998; Duckworth & Gross, 2014; Elliot, 2006; Kruglanski et al., 2002; Schwinger & Stiensmeier-Pelster, 2012; Trope & Liberman, 2010). At the highest levels of a hierarchy are the broad and abstract motivations people have that transcend any given set of circumstances. The lower levels of a hierarchy consist of the specific goals that people pursue in the service of their broad motivations – these goals are tailored to situations that are increasingly

more distinctive and idiosyncratic as one moves down through the hierarchy. Thus, by focusing on the higher levels of their goal hierarchies, people can remind themselves of their underlying reasons for engaging in a particular task; whereas, by focusing on the lower levels, they can become better attuned to the affordances that are available in the present context.

Research suggests one factor that sensitizes people to higher vs. lower levels of their goal hierarchies is construal level. The term “construal” refers to people’s subjective understandings or interpretations of events. The notion that people subjectively construe – and thus motivationally orient – to the same task, object, or event in very different ways is central to construal level theory (e.g., Liberman & Trope, 2008; Trope & Liberman, 2000). Construal level theory proposes that people can construe activities in terms of the abstract, global, and essential features that disparate tasks share in common (i.e., *high-level construal*), or in terms of the concrete, local, and idiosyncratic features that distinguish similar tasks from one another (i.e., *low-level construal*). For example, whereas construing an activity as “studying for an exam” highlights those features that all study activities share, such as acquiring information, construing the same activity as “quizzing myself with flashcards” highlights unique features that distinguish this activity from others forms of studying. An extensive literature demonstrates that shifts in construal level systematically impact evaluation, judgment, decision-making, and behavior (e.g., Fujita, Trope, & Liberman, 2015; Trope & Liberman, 2010).

Importantly, high-level vs. low-level construal is particularly beneficial for performance on the kinds of self-control tasks where the value of a long-term or superordinate goal is pitted against the opportunity costs of having to forgo more immediate impulses or temptations (for a review, see Fujita & Carnevale, 2012; Kalkstein, Fujita, & Trope, 2018). For example, in a sample of participants concerned about weight-loss, those who were induced to approach a

decision task with a high-level construal were more likely to choose an apple over a candy bar compared to those who were induced to approach the task with a low-level construal (Fujita & Han, 2009). Presumably high-level construal made it easier evaluate their choices in light of their highly valued, superordinate goal of losing weight and to perceive the passing temptation of the candy bar as inconsistent with this goal (Carnevale, Fujita, Han, & Amit, 2015; see also Fujita, Trope, Liberman, & Levin-Sagi, 2006; Malkoc, Zauberan, & Bettman, 2010).

Although high-level construal may be generally adaptive when it comes to maintaining the strength of one's task motivation, particularly in the face of conflicting impulses or temptations, it tends to elicit a "global" (versus "local") mode of information processing that may undermine performance on certain kinds of tasks. For instance, research has shown that high-level relative to low-level construal leads to worse performance on tasks that require precision or sensitivity to contextual cues (e.g., Freund & Hennecke, 2015; Gollwitzer & Sheeran, 2006; Pham & Taylor, 1999; Schmeichel, Vohs, & Duke, 2011). More specifically, consider the stop-signal task (Logan, 1994) – a performance task requiring participants to inhibit habitual responses in response to infrequent stop cues. Participants who approach this kind of task with a low-level construal perform relatively well, presumably because their local mode of processing involves carefully monitoring their environment for these stop-cues, and modulating their behavior in response to them as necessary (Schmeichel et al., 2011). Other research suggests that low-level relative to high-level construal is beneficial for tasks that require skilled motor behavior, such as throwing darts (e.g., Zimmerman & Kitsantas, 1997). Thus, similar to the previously discussed trade-offs associated with autonomy vs. control and promotion vs. prevention, research suggests that high- and low-level construal are beneficial for different kinds of tasks.

Accordingly, another way for people to establish task-motivation fit is to engage strategically in high-level construal when presented with tasks that benefit from focusing on one's more abstract, superordinate motivations and goals (e.g., self-control tasks), but to engage in low-level construal when faced with tasks that benefit from a focus on more local considerations (e.g., tasks requiring precision and contextual sensitivity). Initial work examining this possibility focused solely on people's knowledge of the benefits of high-level construal for self-control (MacGregor, Carnevale, Dusthimer, & Fujita, 2017). In one experiment, participants were asked to imagine participating in a market research study that entailed eating cookies that were tasty but not very healthy. To manipulate the presence vs. absence of self-control conflict, half were asked to imagine having the goal of refraining from eating too many cookies (self-control condition); the other half were asked to imagine having the goal of enjoying their eating (control condition). Participants then indicated how useful it would be for achieving their respective goals to ask themselves "why" (or "why not") versus "how" (or "how not") they would engage in this cookie eating task. Whereas asking the question "why" is associated with high-level construal, asking the question "how" is associated with low-level construal (e.g., Freitas, Gollwitzer, & Trope, 2004; Liberman & Trope, 1998). Participants correctly indicated that thinking about "why" relative to "how" would be more useful in the restraint relative to control conditions. In other experiments, participants reported that thinking about the event in more abstract vs. concrete language—another manifestation of high- vs. low-level construal (e.g., Fujita, Henderson, Eng, Trope, & Liberman, 2006; Semin & Fiedler, 1988)—would similarly enhance restraint. Collectively, these findings suggest that people do, at some level, understand the self-control benefits of high- vs. low-level construal.

Subsequent research has explored people's knowledge of the regulatory benefits of both high- *and* low-level construal (Nguyen, Carnevale et al., 2019). In these studies, the tasks that benefited from high-level construal all involved some type of self-control (such as choosing between smaller-immediate vs. larger-delayed monetary outcomes); whereas the tasks that benefited from low-level construal involved some element of precision and/or contextual sensitivity (such as completing a stop-signal task or throwing darts). As an exploratory control condition, participants were also presented with tasks for which performance was not expected to benefit more from high- or low-level construal (such as daydreaming on a bus or going out to dinner with friends).

For each regulatory task, participants were asked to indicate which of two preparatory exercises they would prefer to complete in order to "set their mind." These preparatory exercises were all inductions of high- vs. low-level construal that had been validated in previous research. In one study, for example, participants were told that the exercises would require engaging in global versus local visual processing, respectively (e.g., Kimchi & Palmer, 1982; Smith, Wigboldus, & Dijksterhuis, 2008; Wakslak & Trope, 2009). In another study, participants indicated preferences for exercises that required engaging in superordinate category versus subordinate exemplar generation (e.g., Fujita, Trope et al., 2006). To correctly match the appropriate preparatory exercise to the corresponding regulatory task, participants needed to not only recognize which construal level would benefit task performance, but to also identify which of the preparatory exercises would best instantiate the preferred construal level. In this way, participants' endorsement of one exercise over the other in response to each of the three types of regulatory tasks (high-level vs. low-level vs. control) represented the critical assessment of metamotivational task *and* strategy knowledge.

Results revealed that participants did correctly recognize the benefits of a high- vs. low-level preparatory exercise when faced with tasks for which performance benefits from high- vs. low-level construal, respectively. For instance, before making decisions between smaller-immediate vs. larger-delayed monetary rewards, participants indicated that they preferred the preparatory exercise that entailed global vs. local visual processing. By contrast, when completing a stop-signal task, participants indicated that they preferred the preparatory exercise that entailed subordinate exemplar vs. superordinate category generation. The fact that participants were sensitive to task-motivation fit across a broad range of tasks and preparatory exercises suggests that people's metamotivational knowledge about the functions of high- and low-level construal may be fairly broad and sophisticated.

Importantly, this metamotivational knowledge (like knowledge about promotion and prevention motivation) appears to be universal and not bound to a specific culture. Cross-cultural tests comparing responses of American vs. Japanese participants reveal similar patterns of results (Nguyen, Togawa, Scholer, & Fujita, 2019). Specifically, when asked to indicate preferences of preparatory exercises in response to high-level vs. low-level regulatory tasks, Japanese participants showed the same ability to create task-motivation fit as Americans – suggesting similar metamotivational task and strategy knowledge.

Although research indicates that people are aware of the performance trade-offs associated with high- vs. low-level construal, there was notable individual-level variance in this awareness. For example, in one of the studies by Nguyen, Carnevale et al. (2019; Study 6), only 41% of the sample selected an appropriate preparatory exercise for both of the regulatory tasks, whereas 12.5% selected an inappropriate exercise in both cases and 46% overgeneralized their preference for a particular preparatory exercise across both tasks. This individual-level variance

in strategy preference should have important consequences for how effective people are at regulating their motivation and, consequently, how well they perform on tasks.

Preliminary evidence for this assertion comes from the studies by MacGregor et al. (2017). For example, in one study, participants were asked whether describing the act of eating cookies in more abstract vs. concrete language would benefit restraint. Critically, participants also reported on their degree of dieting motivation, as well as their height and weight (which was used to calculate body mass index). Among participants who were higher in dieting concerns, those who correctly reported that abstract language would be more beneficial for restraint had lower body mass indices, suggesting greater self-control. In another study, undergraduate students in an Introduction to Social Psychology course were asked to describe how they would overcome temptations when preparing for their final exam. They also reported how important and valuable they perceived the course to be and gave the researchers permission to access their final grades in the course. Among students who highly valued the course, those who described their willpower efforts in more abstract relative to concrete terms received higher grades in the course, again suggesting enhanced self-control. Collectively, this provides initial evidence that those with metamotivational knowledge of the benefits of high-level construal experienced superior self-control outcomes.

Implications

Advancing Motivation Science Research

The metamotivation approach outlined in this piece advances motivation science in a number of ways. First, by suggesting that both the quantity and quality of motivation can be the target of regulation, it helps to bridge existing research on motivation regulation (which tends to focus on motivation quantity) with theories that posit qualitatively distinct types of motivation.

On the one hand, the fact that people seem to know about the performance trade-offs associated with different types of motivation suggests that they can regulate their motivation in ways that were not previously appreciated. For example, rather than simply bolstering the overall strength of their motivation, people can also instantiate the particular motivational state that best fits the demands of the current task (e.g., MacGregor et al., 2017; Nguyen, Carnevale et al., 2019; Scholer & Miele, 2016). In addition, rather than attempting to change their motivation in some way (whether it be quantitatively or qualitatively), they can choose a particular task to engage in that they think will benefit from the kind of motivation they are currently experiencing (Scholer & Miele, 2016; see also Delose, vanDellen, & Hoyle, 2015). On the other hand, the fact that people know about the differential benefits of promotion vs. prevention, autonomy vs. control, and high- vs low-level construal also helps to expand our understanding of regulatory focus theory, self-determination theory, and construal level theory. For instance, it suggests that people may have the capacity to use construal level strategically in their everyday lives. Thus, rather than serving as artificial lab-based manipulations, construal level inductions can perhaps be used as regulatory strategies in real-world contexts.

Knowledge as a Source of Self-Regulatory Success vs. Failure

A second major advance of the metamotivational approach is spotlighting the accuracy or inaccuracy of people's beliefs about motivation as a source of goal success vs. failure. Self-regulation research has traditionally focused on the ways in which people use strategies or exercise abilities (e.g., inhibit undesired thoughts, emotions, and behavioral tendencies) to broadly exert control over their motivation. For instance, many of the motivation regulation studies from within educational psychology have focused on how students' *general* use of regulation strategies predicts their academic achievement and other outcomes (e.g., Grunschel et

al., 2016; Kim et al., 2018; Schwinger et al., 2009). Similarly, self-regulation research from the cognitive control tradition is largely predicated on the idea that basic cognitive capacities such as executive attention, executive functioning, and working memory play central roles in people's goal pursuit efforts across contexts (e.g., Miyake & Friedman, 2012; Hofmann, Schmeichel, & Baddeley, 2012; Posner & Rothbart, 1998).

In contrast, the metamotivational approach suggests that understanding people's strategies and abilities provides only partial insight into the self-regulation puzzle – one still needs to know *when* to deploy these skills. Any inaccurate or erroneous beliefs about when it is appropriate to apply these skills (i.e., in what context and for which task) are likely to undermine effective self-regulation. Thus, as opposed to focusing solely on how people exert control, our framework also focuses on how people monitor the situation and their internal states based on their metamotivational knowledge.

Importantly, focusing on what people know about motivation, rather than their general self-regulatory strategies and capacities, pushes researchers to move beyond trying to account for who is “good” or “bad” at self-regulating across contexts and to instead focus on what types of tasks particular individuals are likely to struggle with. Consider, for example, the self-regulatory efforts of concert pianists. To be successful, pianists must overcome the drudgery and frustration of daily practice in favor of perfecting their craft. They must also execute these learned skills and make appropriate adjustments when performing on a specific piano in a particular concert hall on any given day. Whereas high-level construal should promote the former type of behavior, low-level construal should promote the latter. The pianist who erroneously believes that engaging in high-level construal is always beneficial for task performance can be expected to endure and persist in daily practice, but may be insensitive to the subtle contextual cues that make for

successful recital performances. Conversely, the pianist who erroneously believes that engaging in low-level construal is always beneficial for task performance is likely to exhibit the opposite pattern: regularly giving daily practices short shrift, but being hyper-tuned to the subtle cues in the performance environment. Both pianists are likely to struggle to attain their goals, but for very different reasons.

The previous example highlights how differences in metamotivational task knowledge can help explain why the same person might regulate her motivation in an effective manner on one task, but not on another. Further, in our framework, successful self-regulation also requires accurate strategy knowledge and self-knowledge. Thus, even people with a sophisticated understanding of the performance trade-offs associated with various types of motivation may struggle to successfully regulate their motivation at times. For instance, such a person may mistakenly believe that she is already in a motivational state that is adaptive for the current task when she is in fact not (poor self-knowledge); as a result, she may begin the task motivationally unprepared and then perform in a suboptimal manner. Similarly, another individual may possess accurate task and self-knowledge, but not know how to shift herself into the motivational state that she believes will be more adaptive for the task than the state she is currently experiencing (poor strategy knowledge). Exploring each type of knowledge systematically will be key to understanding who, when, and why some individuals succeed at regulating their motivational states, whereas others fail.

The Centrality of Flexibility

The previous example also highlights a third advance of the metamotivational approach, which is the importance of *motivational flexibility* for self-regulatory success. In contrast to some other theories of motivation, the metamotivational approach takes as a given that no single

motivational orientation or state ensures success. An orientation that is best suited for one task may undermine performance on another. Successful self-regulation requires people to be sensitive to the changing motivational demands across various tasks and to shift their motivational orientation to match these changing demands. If people are unable to shift their motivational states, optimal self-regulation may require that they instead be more flexible in what tasks they perform first. In either case, rather than insist on a one-size-fits-all approach, the metamotivation approach suggests that effective self-regulation requires tailoring one's response to the motivational affordances of different situations and tasks.

Future Directions

Predicting Real-World Outcomes

Our metamotivational research to-date has largely focused on understanding what people's beliefs about motivation are and the extent to which they are accurate vs. inaccurate. A central assertion of the metamotivational approach, however, is that these beliefs guide people's efforts at regulating their motivation and should therefore impact performance and other outcomes. Some work has shown that these beliefs impact which strategies people choose to implement or which tasks they decide to engage in (e.g., Edwards et al., 2019; Nguyen, Carnevale et al., 2019; Scholer & Miele, 2016) – an important component of self-regulation (e.g., Gollwitzer, 1999). Other work provides preliminary evidence that people's metamotivational knowledge may predict goal success in domains such as weight-loss and academics (e.g., MacGregor et al., 2017; Ross et al., 2019). This work notwithstanding, more research needs to be conducted to establish and characterize the impact of metamotivational knowledge on performance and outcomes in real-world contexts.

The ability to predict performance and other outcomes may require further development and validation of diagnostic assessments of this knowledge. Research to-date has largely adopted indirect measurement strategies in which participants are presented with various scenarios and asked to select options based on their preferences or expectations (e.g., Murayama et al., 2016; Nguyen, Carnevale, et al., 2019; Scholer & Miele, 2016). An alternative strategy has been to observe participants' spontaneous responses in critical goal-relevant contexts and to then code these responses as reflecting accurate vs. inaccurate beliefs (e.g., MacGregor et al., 2017). An important question that arises is whether one assessment approach is superior to the other in predicting behavior. Similarly, it may also be possible that more direct measurement approaches – such as directly asking participants what they think the best response to a situation might be – may be equally or more valid for prediction.

It is also important to note that the existing measurement approaches involve coding responses as accurate or inaccurate depending on whether they align with theoretical predictions and/or past empirical findings. Thus, another important question is whether the accuracy of people's metamotivational beliefs should instead be assessed based on how well each individual performs a task when experiencing a particular motivational state (rather than on how people perform more generally). For example, although individuals generally persist longer on open-ended tasks when experiencing intrinsic motivation, a particular individual may find that she persists longer on such tasks when motivated by extrinsic incentives. In this case, we would not want to label the person's beliefs about the utility of extrinsic motivation to be inaccurate. Using a person's own performance as the standard for assessing the accuracy of her beliefs is an approach that is common in the metacognition literature (see Dunlosky & Metcalfe, 2009).

Clearly, questions about how best to measure people's metamotivational beliefs are ripe for future research.

Self-Knowledge

Most research on metamotivation has focused on whether people have task and strategy knowledge concerning various motivational states, such as promotion/prevention, autonomy/control, and high/low level construal (Edwards et al., 2019; Nguyen, Carnevale et al., 2019; Scholer & Miele, 2016). Almost no work to-date has examined the third type of knowledge that we view as necessary for regulating one's own motivation – i.e., insight into one's motivational states and tendencies (see Flavell, 1979; Pintrich, 2002, for a discussion of self-knowledge in the metacognitive domain). In our framework, self-knowledge is necessary for determining whether and to what extent one needs to modulate one's own motivation. For instance, although a person may know that she should approach a particular task with a prevention focus, she may not take steps to shift herself into this motivational state unless she realizes that she is currently experiencing a promotion focus.

Our metamotivational framework highlights innovative directions that research on self-knowledge might explore. Two important questions that arise are what do particular motivational states subjectively feel like, and what cues do people use to recognize that they are in these states. Motivation science has traditionally taken for granted that people can identify the quantity of motivation that they are experiencing, but whether they can accurately identify the quality of their motivation is unknown. The ability to self-report intrinsic vs. extrinsic motivation reliably (e.g., Amabile, Hill, Hennessey, & Tighe, 1994; Vallerand et al., 1992) may suggest that people do have insight into the quality of their motivational states. What is less well-known, however, is

how people come to understand that they are in a promotion vs. prevention focus or a high-level vs. low-level construal state.

In other work (Miele & Scholer, 2018), we have suggested that people may monitor and manage their motivations by attending to their *metamotivational feelings*. For instance, feelings such as hope or excitement (as well as related thoughts and behaviors) may at times serve as metamotivational cues that signal the presence of promotion motivation. As with the monitoring of any internal state, people may differ widely in terms of how much self-insight that they possess. Thus, research might also seek to explore predictors of individual or temporal variation in people's levels of self-insight (i.e., what makes some people particularly good at detecting their motivational states?). Individual differences in interoceptive (Critchley & Garfinkel, 2017) and mood awareness (Swinkels & Giuliano, 1995) seem like particularly strong candidates for such exploration. In addition, it is possible that situational factors, such as objective self-awareness (e.g., Duval & Wicklund, 1972), may also enhance the perceptibility of motivational states.

Another aspect of self-knowledge that will be important to explore is the implicit theories people use to interpret their motivational experiences (including their metamotivational feelings). For instance, when people feel bored during a task and are in danger of quitting, the likelihood they will take steps to increase their motivation may depend on whether or not they believe that their experiences of interest or boredom are changeable. Consistent with this possibility, Thoman et al. (in press) recently showed that participants' implicit beliefs about interest predicted their use of interest regulation strategies during a boring task. Other researchers (King, 2019) have measured these beliefs more broadly and found that they are associated with students' academic engagement. Future research should explore the extent to which people's beliefs about the

malleability of specific motivational constructs (e.g., interest, task value, self-efficacy) are associated with their more general beliefs about motivation.

Creating Fit

The extant metamotivation literature has generally focused on how people create task-motivation fit by bolstering or shifting their motivational states. Yet one can also create task-motivation fit by choosing tasks that fit one's current motivational states. Although the research we have reviewed indicates that people create fit through both mechanisms (e.g., Scholer & Miele, 2016), the creation of fit via task selection represents an understudied area in motivation research. This oversight is surprising, however, given that this is a critical problem for people attempting to balance the pursuit of multiple goals. The exploration of this issue through the lens of metamotivation may open new lines of inquiry that examine the question of when people choose to pursue which goal.

In some cases, people may actively choose between modulating their motivational states *vs.* strategically selecting the tasks they complete. Both approaches can be used to optimize task performance, yet people may differ in their ability and/or preference to regulate in each of these two ways. Those who struggle to modify or modulate their internal states, for example, may be unable to re-orient motivationally, and thus prefer to regulate the order in which they complete certain tasks. By contrast, those who lack independence or the authority to choose what to do may have to resort to regulating their underlying motivational orientations. The metamotivational approach thus proposes that future research should systematically explore the questions of who, when, and why people create motivational fit by modulating their motivational states *vs.* prioritizing some tasks over others.

A third approach to regulating motivation (an approach originally suggested by regulatory fit theory; Higgins, 2000) is to strategically approach tasks in a manner that fits with one's chronic and perhaps preferred orientation, irrespective of task demands. Someone who is chronically motivated by promotion, for example, may generally prefer eager information processing strategies, even when task performance might benefit from prevention. To the extent that it is uncomfortable or difficult for this person to sustain the orientation demanded by the task (Lisjak, Molden, & Lee, 2012), she may ultimately decide to abandon efforts to create task-motivation fit. Instead, she may "double-down" on her preferred chronic motivational state and amplify engagement by trying to establish what we have referred to as orientation-strategy fit (Scholer & Miele, 2016).

A related question that future research should address is how people choose between different motivational states when several might be adaptive. Consider, for example, tasks that require vigilance, such as proofreading. The drive to ensure against losses that is elicited by a prevention orientation should enhance performance. The orientation toward detail and narrowed attentional focus of low-level construal, however, should similarly promote performance. How people choose between multiple adaptive orientations (or perhaps combine orientations) is an important question to resolve, particularly if researchers hope to predict behavior. Conversely, it is also important to consider how certain orientations might be simultaneously adaptive and maladaptive for a particular task. For instance, consider a task that requires precise motor control but also involves a self-control conflict (such as trying to practice for your piano recital when your brother wants you to come play video games). On the one hand, adopting a high-level construal would help with inhibiting the impulse to play video games; but, on the other hand, it would elicit a global attentional focus that might undermine the quality of one's practice. In such

cases, it could be beneficial to approach the task by engaging in low level construal and then selectively implement a regulation strategy that induces a high-level construal each time the temptation to quit practicing becomes salient.

Development and Acquisition of Knowledge

A critical question that we have only recently begun to address concerns the development and acquisition of metamotivational beliefs. Recent evidence suggests that children as young as seven appear to have some knowledge of how promotion and prevention motivations fit with different tasks (i.e., task knowledge; Scholer, Hartman, Hubley, Wilson, & Henderson, 2019), though they do not appear to fully understand how to induce these states in themselves (i.e., strategy knowledge). Specifically, children were told about a Lego task in which they would have to use their imagination to construct an original building that might exist in the future (i.e., a task that required eager processing) or a Lego task in which they would have to construct a building following very specific rules (i.e., a task that required vigilant processing). They were also presented with descriptions of promotion and prevention motivations. Similar to the college students in our original studies (Scholer & Miele, 2016), children reported that they would perform better on the eager versus vigilant task when promotion-focused, but would perform better on the vigilant versus eager task when prevention-focused (task knowledge). Children were also asked to report how particular strategies—focusing on their strengths or focusing on their weaknesses—would affect performance, given prior work linking these strategies to the upregulation of promotion and prevention motivation, respectively (Scholer, Ozaki, & Higgins, 2014). Although children exhibited accurate task knowledge, children did not exhibit accurate strategy knowledge with these specific strategies.

These findings suggest that children might acquire particular types of metamotivational knowledge at different points in development. They also raise the question of where children acquire this knowledge and who they acquire it from. One possibility is that caregivers teach children about the nature of motivation as the latter encounter various motivational challenges. For example, children may be taught to construe temptations in high-level terms (e.g., focus on *why* it is important to wait until the morning to open Christmas gifts) as a means of enhancing self-control. By contrast, when learning precise performance skills such as playing the piano, children might instead be taught to construe these challenges in low-level terms (e.g., focus on playing this note with this finger in this way). These experiences may teach children how to distinguish different types of regulatory demands and help them identify the various ways to optimize their current motivational states. Alternatively, people may learn through trial-and-error. That is, if a particular strategy for dealing with a given regulatory challenge has worked in the past, people may continue to use it in similar situations; but if it leads to poor outcomes, they may be more likely to test other strategies. It is also possible that people logically deduce metamotivational knowledge, much as researchers have done to develop theories of self-regulation and motivation. Researchers should consider examining these possibilities developmentally, as people may acquire metamotivational beliefs via different routes depending on age. For example, it might be unreasonable to expect young children to acquire metamotivational knowledge via logical deduction given what we know about their cognitive development (Ricco, 2015).

A related question is how best to transmit metamotivational knowledge. As noted earlier, existing research has assumed certain types of metamotivational knowledge to be tacit or implicit. This might suggest that this knowledge would be better acquired via experiential rather

than didactic mechanisms. For instance, teachers and experts might not be able to explain how to respond to various regulatory challenges, but they may be able to show students by repeatedly modeling behavior in a wide range of circumstances. Alternatively, to the extent that people do have insight into their metamotivational knowledge, it may be possible to transmit this knowledge to others through direct teaching. Addressing these questions will be necessary for the development of interventions and instructional practices aimed at increasing people's metamotivational knowledge and improving their self-regulation.

Another intriguing possibility is that people may learn to regulate their own motivation through efforts to motivate others. Coaches, teachers, mentors, and employers must all exhort others to work harder and to achieve ever higher levels of performance. It may be that the regulation of others' motivations informs people about how best to regulate their own motivational states. The demands of the social roles people play (e.g., working as a coach who is responsible for the performance of 50 athletes) may incentivize and encourage them to attend to and study the co-variation between various motivational states, tasks, and outcomes (e.g., promotion motivation leads to more goals when the team is on offense). Conversely, possessing accurate metamotivational knowledge about one's own motivational states may make one more effective in these high-responsibility social roles. For example, someone who understands how to establish task-motivation fit for herself may be particularly good at assigning tasks to people based on their motivational tendencies (i.e., at creating task-motivation fit for others; see Jansen et al., 2019). In these ways, investigating the antecedents and consequences of metamotivational knowledge in the interpersonal domain promises to be a generative and insightful extension of the present approach.

Linking Metamotivation to General Motivational Competency

Metamotivation research has largely examined people's knowledge of motivational orientations or states in isolation. That is, in separate lines of research, investigators have examined what people know about promotion vs. prevention, high-level vs. low-level construal, and intrinsic vs. extrinsic motivation. Less has been done to examine the extent to which knowledge might be correlated across these domains. It may be the case that those who are particularly motivationally skilled have high levels of knowledge across multiple domains – a kind of motivational “g” that predicts success at securing desired ends across a number of contexts. One might expect individuals high in this general ability to evidence superior self-regulatory outcomes.

In keeping with this idea, future research might link metamotivational knowledge to constructs such as grit. Grit is conceptualized as a trait that allows people to pursue long-term goals with passion and perseverance (e.g., Duckworth & Gross, 2014). From a metamotivational perspective, grit entails maintaining one's motivation over long durations of time and in the face of challenges (see also Jachimowicz, Wihler, Bailey, & Galinsky, 2018). Rather than conceptualize grit as a trait, however, the metamotivational approach suggests that grit is a skill – the ability to implement strategies that maintain the right amount and type of motivation to pursue a goal. Critically, whereas a trait approach provides little insight into how best to increase or improve grit, the metamotivational approach highlights the possession of accurate knowledge and the appropriate implementation of this knowledge as key to improving self-regulation. Thus, whereas the trait approach typically espoused by grit researchers may help identify individuals likely to persist or not, the metamotivational approach not only identifies these individuals but also provides concrete guidelines for intervention and improvement. Empirical research is

needed, however, to link metamotivational knowledge directly to grit and to other related constructs.

Toward a Comprehensive Mechanistic Model of Metamotivation

Our review and discussion of the existing metamotivation literature has focused on people's regulation of the quality rather than the quantity of motivation. As noted before, this emphasis reflects the fact that regulation of quality is a key hallmark of our metamotivational framework. We do not, however, suggest that the regulation of motivation quantity is a less critical metamotivational process; in fact, we argue that more research is needed to understand how people monitor and control the degree to which they are motivated to pursue their task goals. An important aim of future research should therefore be to develop a comprehensive mechanistic framework that models both the regulation of quantity and quality of motivation (see Miele & Scholer, 2018, for an initial attempt at this).

One key question that a comprehensive mechanistic framework must address is how people determine that they have the right amount and type of motivation to achieve their goals. In a prior review (Miele & Scholer, 2018), we suggested that they accomplish this in part by monitoring and strategically modulating the specific components that underlie their motivation (e.g., intrinsic value, self-relevant value, self-efficacy), rather than focusing solely on some broad or holistic experience of motivation (see Engelschalk, Steuer, & Dresel, 2016; Sansone et al., 1992; Wolters, 1998). In addition, we posited several criteria for identifying the components that people target when regulating their motivation, including the possibility that high levels of such components are associated with unique sets of phenomenological feelings or experiences. As discussed earlier, these metamotivational feelings may play an important role in detecting the quality of one's current motivational states (e.g., whether one is promotion- or prevention-

focused; Miele & Scholer, 2018). Metamotivational feelings, however, may also serve as important inputs for determining whether one is insufficiently motivated (i.e., low quantity) or is not motivated to perform a task in the right way (i.e., lack of task-motivation fit).

As an example of a feeling that signals a motivational deficit, consider boredom. The experience of boredom may signal to an individual that her initial interest in the task (which gave rise to an experience of intrinsic motivation) is being undermined by the costs associated with performing that task (e.g., when a textbook chapter is so dull that a student is no longer interested in the material or does not want to continue reading). If the feeling is strong enough and is accompanied by a desire to disengage from the task, the individual may decide to implement a strategy that either bolsters the motivation component in question (i.e., intrinsic value) or eliminate the costs that are interfering with it. If the strategy is successful, the individual may come to experience a renewed interest in the task. This interest signals to the person that no further regulation is necessary. In this way, metamotivational feelings may initiate and terminate metamotivational regulation in a bottom-up manner during task completion or goal pursuit.

To the extent that metamotivational feelings are like other types of metacognitive and affective states that operate at the “fringe” of consciousness, they are presumably capable of representing “large amounts of information in a condensed format, to avoid exceeding the limited capacity of consciousness” (Norman, Price, & Duff, 2010, p. 68). Thus, metamotivational feelings may allow people to monitor their motivation in an efficient manner, while maintaining their focus on the primary activity (e.g., learning the material). That is, rather than having to continually interrupt their execution of a task in order to check if they are sufficiently motivated to continue, people can instead wait until their metamotivational feelings automatically trigger the use of a particular regulation strategy.

In addition to signaling deficits in the quantity of motivation, metamotivational feelings may also signal a lack of compatibility between the quality of one's motivation and the demands of the current task (i.e., a lack of task-motivation fit). This possibility is line with regulatory fit theory (Higgins, 2000), which suggests that when individuals engage in strategies (e.g., eager vs. vigilant information processing) that do not match their underlying motivational orientation (e.g., promotion vs. prevention), they experience a feeling of “nonfit” (of going about the task in the wrong manner) that is demotivating (Higgins, 2000). If an individual responds to this feeling by taking steps to shift herself into a type of motivation that is more compatible with the task, she may come to experience a feeling of “fit” (of going about the task in the *right* manner) that is energizing and that is associated with improved performance, goal commitment, and task enjoyment (Higgins, 2000).

Summary

In this piece, we have spotlighted an emerging area of motivation science research – namely, metamotivation. This approach is novel in that it suggests that people modulate both the quality and quantity of their motivational states in order to achieve desired ends. Given that motivational states are often critical precursors to how people think, feel, and act—the targets of traditional approaches to self-regulation—research on metamotivation may reveal particularly efficient means by which people can regulate their goal pursuit. We have reviewed research that indicates that people often have the requisite metamotivational knowledge to leverage promotion vs. prevention orientations, autonomous vs. controlled motivations, and high- vs. low-level construals to enhance performance on goal-directed tasks. At the same time, there is variability in the accuracy of these beliefs, suggesting clear opportunities for intervention. We hope to

inspire others to pursue the many innovative and novel research questions that the metamotivational framework raises, and look forward to the insights such work will provide.

References

- Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The Work Preference Inventory: Assessing intrinsic and extrinsic motivational orientations. *Journal of Personality and Social Psychology, 66*(5), 950-967.
- Baas, M., De Dreu, C. K.W., & Nijstad, B. A. (2011). When prevention promotes creativity: The role of mood, regulatory focus, and regulatory closure. *Journal of Personality and Social Psychology, 100*(5), 794–809. <http://dx.doi.org/10.1037/a0022981>
- Bittner, J. V., Bruena, M., & Rietzschel, E. F. (2016). Cooperation goals, regulatory focus, and their combined effects on creativity. *Thinking Skills and Creativity, 19*, 260-268. <https://doi.org/10.1016/j.tsc.2015.12.002>
- Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science, 8*(6), 591–612. <https://doi.org/10.1177/1745691613504116>
- Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science, 15*(7), 482–487. <http://dx.doi.org/10.1111/j.0956-7976.2004.00705.x>
- Carnevale, J. J., Fujita, K., Han, H. A., & Amit, E. (2015). Immersion versus transcendence: How pictures and words impact evaluative associations assessed by the implicit association test. *Social Psychological and Personality Science, 6*(1), 92-100.
- Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York, NY: Cambridge University Press. <https://doi.org/10.1017/cbo9781139174794>

- Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological Bulletin*, *140*(4), 980–1008. <https://doi.org/10.1037/a0035661>
- Cheng, C. (2003a). Cognitive and motivational processes underlying coping flexibility: A dual-process model. *Journal of Personality and Social Psychology*, *84*(2), 425–438. <http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1037/0022-3514.84.2.425>
- Cheng, C. (2003b). Discriminative facility: Cognitive mechanisms of coping. In R. Roth, L. Lowenstein, & D. Trent (Eds.), *Catching the future: Women and men in global psychology* (pp. 81–89). Lengerich, Germany: Pabst.
- Cheng, C., Chan, N., Chio, J. H., Chan, P., Chan, A. O., & Hui, W. (2012). Being active or flexible? Role of control coping on quality of life among patients with gastrointestinal cancer. *Psycho-Oncology*, *21*(2), 211–218. <http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1002/pon.1892>
- Cheng, C., Chiu, C., Hong, Y., & Cheung, J. S. (2001). Discriminative facility and its role in the perceived quality of interactional experiences. *Journal of Personality*, *69*(5), 765–786. <http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1111/1467-6494.695163>
- Cheng, C., Lau, H.-P. B., & Chan, M.-P. S. (2014). Coping flexibility and psychological adjustment to stressful life changes: a meta-analytic review. *Psychological Bulletin*, *140*(6), 1582–1607. <https://doi.org/10.1037/a0037913>
- Chiu, C.-Y., Hong, Y.-Y., Mischel, W., & Shoda, Y. (1995). Discriminative facility in social competence: Conditional versus dispositional encoding and monitoring-blunting of information. *Social Cognition*, *13*(1), 49–70. <https://doi.org/10.1521/soco.1995.13.1.49>

- Corno, L. (1989). Self-regulated learning: A volitional analysis. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement* (pp. 111–141). New York, NY: Springer. https://doi.org/10.1007/978-1-4612-3618-4_5
- Corno, L. (2001). Volitional aspects of self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd .ed., pp. 191–226). Mahwah, NJ: Erlbaum.
<https://doi.org/10.4324/9781410601032>
- Critchley, H. D., & Garfinkel, S. N. (2017). Interoception and emotion. *Current Opinion in Psychology*, *17*, 7-14.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268.
http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1207/S15327965PLI1104_01
- Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 416-436). Thousand Oaks, CA, : Sage Publications Ltd.
<http://dx.doi.org/10.4135/9781446249215.n21>
- Delose, J. E., vanDellen, M. R., & Hoyle, R. H. (2015). First on the list: Effectiveness at self regulation and prioritizing difficult exercise goal pursuit. *Self and Identity*, *14*(3), 271-289.
- Dholakia, U. M., Gopinath, M., Bagozzi, R. P., & Natarajan, R. (2006). The role of regulatory focus in the experience and self-control of desire for temptations. *Journal of Consumer Psychology*, *16*, 163–175. https://doi.org/10.1207/s15327663jcp1602_7

- Duckworth, A., & Gross, J. J. (2014). Self-control and grit related but separable determinants of success. *Current Directions in Psychological Science*, *23*, 319–325.
<https://doi.org/10.1177/0963721414541462>
- Dunlosky, J., & Metcalfe, J. (2009). *Metacognition*. Thousand Oaks, CA: Sage.
- Duval, S., & Wicklund, R. A. (1972). A theory of objective self-awareness. New York: Academic Press
- Eckerlein, N., Roth, A., Engelschalk, T., Steuer, G., Schmitz, B., & Dresel, M. (2019). The role of motivational regulation in exam preparation: Results from a standardized diary study. *Frontiers in Psychology*, *10*(81), 1-9.
- Edwards, J., Hubley, C., Scholer, A. A., & Miele, D. B. (2019). Metamotivational beliefs about intrinsic and extrinsic motivation. *Manuscript in preparation*.
- Elliot, A. J. (2006). The hierarchical model of approach-avoidance motivation. *Motivation and Emotion*, *30*(2), 111-116.
- Engelschalk, T., Steuer, G., & Dresel, M. (2016). Effectiveness of motivational regulation: Dependence on specific motivational problems. *Learning and Individual Differences*, *52*, 72–78. <https://doi.org/10.1016/j.lindif.2016.10.011>
- Fishbach, A., Zhang, Y., & Trope, Y. (2010). Counteractive evaluation: Asymmetric shifts in the implicit value of conflicting motivations. *Journal of Experimental Social Psychology*, *46*(1), 29-38.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist*, *34*(10), 906–911.
<https://doi.org/10.1037/0003-066X.34.10.906>

- Ford, B. Q., & Tamir, M. (2012). When getting angry is smart: Emotional preferences and emotional intelligence. *Emotion, 12*(4), 685–689. <http://dx.doi.org/10.1037/a0027149>
- Förster, J., & Higgins, E. T. (2005). How global versus local perception fits regulatory focus. *Psychological Science, 16*(8), 631–636. <https://doi.org/10.1111/j.1467-9280.2005.01586.x>
- Freitas, A. L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology, 40*(6), 739-752.
- Freitas, A. L., Liberman, N., & Higgins, E. T. (2002). Regulatory fit and resisting temptation during goal pursuit. *Journal of Experimental Social Psychology, 38*(3), 291–298. <http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1006/jesp.2001.1504>
- Freund, A. M., & Hennecke, M. (2015). On means and ends: The role of goal focus in successful goal pursuit. *Current Directions in Psychological Science, 24*(2), 149-153.
- Friedman, R. S., & Förster, J. (2001). The effects of promotion and prevention cues on creativity. *Journal of Personality and Social Psychology, 81*(6), 1001–1013. <https://doi.org/10.1037/0022-3514.81.6.1001>
- Fujita, K. (2011). On conceptualizing self-control as more than the effortful inhibition of impulses. *Personality and Social Psychology Review, 15*(4), 352-366.
- Fujita, K., & Carnevale, J. J. (2012). Transcending temptation through abstraction: The role of construal level in self-control. *Current Directions in Psychological Science, 21*(4), 248–252. <https://doi.org/10.1177/0963721412449169>

- Fujita, K., & Han, H. A. (2009). Moving beyond deliberative control of impulses: The effect of construal levels on evaluative associations in self-control conflicts. *Psychological Science, 20*(7), 799-804.
- Fujita, K., Henderson, M. D., Eng, J., Trope, Y., & Liberman, N. (2006). Spatial distance and mental construal of social events. *Psychological Science, 17*(4), 278-282.
- Fujita, K., Trope, Y., & Liberman, N. (2016). On the psychology of near and far: A construal level theoretic approach. In G. Keren & G. Wu (Eds.), *Wiley-Blackwell handbook of judgment and decision-making* (pp. 404–430). Oxford, UK: Wiley-Blackwell.
- Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self control. *Journal of Personality and Social Psychology, 90*(3), 351-367
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*(7), 493-503.
- Gollwitzer, P. M., & Sheeran, P. (2006). Implementation intentions and goal achievement: A meta-analysis of effects and processes. *Advances in Experimental Social Psychology, 38*, 69-119.
- Grunschel, C., Schwinger, M., Steinmayr, R., & Fries, S. (2016). Effects of using motivational regulation strategies on students' academic procrastination, academic performance, and well-being. *Learning and Individual Differences, 49*, 162–170.
<https://doi.org/10.1016/j.lindif.2016.06.008>
- Heckhausen, H. (1991). *Motivation and action* (P. K. Leppmann, Trans.). Berlin, Germany: Springer-Verlag. <https://doi.org/10.1007/978-3-642-75961-1>
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist, 52*(12), 1280–1300.
<https://doi.org/10.1037/0003-066X.52.12.1280>

- Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist*, *55*(11), 1217–1230.
- Higgins, E. T. (2008). Culture and personality: Variability across universal motives as the missing link. *Social and Personality Psychology Compass*, *2*(2), 608–634.
<https://doi.org/10.1111/j.1751-9004.2007.00075.x>
- Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology*, *72*(3), 515–525. <https://doi.org/10.1037/0022-3514.72.3.515>
- Hilgard, E. R. (1980). The trilogy of mind: Cognition, affection, and conation. *Journal of the History of the Behavioral Sciences*, *16*, 107–117. [https://doi.org/10.1002/1520-6696\(198004\)16:2<107::AID-JHBS2300160202>3.0.CO;2-Y](https://doi.org/10.1002/1520-6696(198004)16:2<107::AID-JHBS2300160202>3.0.CO;2-Y)
- Hofmann, W., Schmeichel, B. J., & Baddeley, A. D. (2012). Executive functions and self regulation. *Trends in Cognitive Sciences*, *16*(3), 174-180.
- Jachimowicz, J. M., Wihler, A., Bailey, E. R., & Galinsky, A. D. (2018). Why grit requires perseverance and passion to positively predict performance. *Proceedings of the National Academy of Sciences*, *115*(40), 9980-9985.
- Jansen, E., Moore, A., Scholer, A. A., Fujita, K., & Miele, D. B. (2019). The role of metamotivation in managing the motivation of others. *Manuscript in preparation*.
- Kalkstein, D., Fujita, K., & Trope, Y. (2018). Broadening mental horizons to resist temptation: Construal level and self-control. In D. de Ridder, M. Adriaanse, & K. Fujita (Eds.), *The Routledge international handbook of self-control in health and well-being* (pp. 180-192). New York, NY: Routledge.

- Kim, Y. E., Brady, A. C., & Wolters, C. A. (2018). Development and validation of the brief regulation of motivation scale. *Learning and Individual Differences, 67*, 259-265.
- Kimchi, R., & Palmer, S. E. (1982). Form and texture in hierarchically constructed patterns. *Journal of Experimental Psychology: Human Perception and Performance, 8*(4), 521-535.
- King, R. B. (2019). Growth mindsets of motivation and academic engagement. *Unpublished data*.
- Kobylińska, D., & Kusev, P. (2019). Flexible Emotion Regulation: How Situational Demands and Individual Differences Influence the Effectiveness of Regulatory Strategies. *Frontiers in Psychology, 10*. <https://doi.org/10.3389/fpsyg.2019.00072>
- Kruglanski, A. W., Friedman, I., & Zeevi, G. (1971). The effects of extrinsic incentive on some qualitative aspects of task performance. *Journal of Personality, 39*(4), 606–617. <https://doi.org/10.1111/j.1467-6494.1971.tb00066.x>
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 331–378). San Diego, CA: Academic Press. [https://doi.org/10.1016/s0065-2601\(02\)80008-9](https://doi.org/10.1016/s0065-2601(02)80008-9)
- Kuhl, J. (1984). Volitional aspects of achievement motivation and learned helplessness: Toward a comprehensive theory of action control. In B. A. Maher & W. B. Maher (Eds.), *Progress in experimental personality research* (Vol. 13, pp. 99–171). New York, NY: Academic Press. <https://doi.org/10.1016/B978-0-12-541413-5.50007-3>

- Kuhl, J. (1985). Volitional mediators of cognition-behavior consistency: Self-regulatory processes and action versus state orientation. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognition to behavior* (pp. 101-128). Berlin: Springer-Verlag.
- Kuhl, J., & Beckmann, J. (1985). Historical perspectives in the study of action control. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 89–100). Berlin, Germany: Springer-Verlag. https://doi.org/10.1007/978-3-642-69746-3_5
- Levy-Gigi, E., Bonanno, G. A., Shapiro, A. R., Richter-Levin, G., Kéri, S., & Sheppes, G. (2016). Emotion Regulatory Flexibility Sheds Light on the Elusive Relationship Between Repeated Traumatic Exposure and Posttraumatic Stress Disorder Symptoms. *Clinical Psychological Science, 4*(1), 28–39. <https://doi.org/10.1177/2167702615577783>
- Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75*(1), 5-18.
- Liberman, N., & Trope, Y. (2008). The psychology of transcending the here and now. *Science, 322*(5905), 1201–1205. <http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1126/science.1161958>
- Lisjak, M., Molden, D. C., & Lee, A. Y. (2012). Primed interference: The cognitive and behavioral costs of an incongruity between chronic and primed motivational orientations. *Journal of Personality and Social Psychology, 102*(5), 889-909.
- Ljubin-Golub, T., Petričević, E., & Rovani, D. (2019). The role of personality in motivational regulation and academic procrastination. *Educational Psychology, 39*(4), 550-568.
- Logan, G. D. (1994). On the ability to inhibit thought and action: A user's guide to the stop signal paradigm. In D. Dagenbach & T. H. Carr (Eds.), *Inhibitory processes in attention, memory, and language* (pp. 189–239). San Diego, CA: Academic Press.

- 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.
- Malkoc, S. A., Zauberan, G., & Bettman, J. R. (2010). Unstuck from the concrete: Carryover effects of abstract mindsets in intertemporal preferences. *Organizational Behavior and Human Decision Processes, 113*(2), 112-126.
- Miele, D. B., & Scholer, A. A. (2018). The role of metamotivational monitoring in motivation regulation. *Educational Psychologist, 53*(1), 1-21.
- Miele, D. B., & Wigfield, A. (2014). Quantitative and qualitative relations between motivation and critical-analytic thinking. *Educational Psychology Review, 26*, 519–541.
<https://doi.org/10.1007/s10648-014-9282-2>
- Mischel, W., Shoda, Y., & Rodriguez, M. I. (1989). Delay of gratification in children. *Science, 244*(4907), 933-938.
- Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions: Four general conclusions. *Current Directions in Psychological Science, 21*(1), 8-14.
- Motyka, S., Grewal, D., Puccinelli, N. M., Roggeveen, A. L., Avnet, T., Daryanto, A., ... Wetzels, M. (2014). Regulatory fit: A meta-analytic synthesis. *Journal of Consumer Psychology, 24*(3), 394–410. <https://doi.org/10.1016/j.jcps.2013.11.004>
- Murayama, K., Kitagami, S., Tanaka, A., & Raw, J. A. L. (2016). People's naivete about how extrinsic rewards influence intrinsic motivation. *Motivation Science, 2*, 138–142.

- Nelson, T. O., & Narens, L. (1990). Metamemory: A theoretical framework and new findings. In G. H. Bower (Ed.), *The psychology of learning and motivation* (Vol. 26, pp. 125–173). New York, NY: Academic Press. [https://doi.org/10.1016/s0079-7421\(08\)60053-5](https://doi.org/10.1016/s0079-7421(08)60053-5)
- 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*. Advance online publication. <http://dx.doi.org/10.1037/pspa0000166>
- Nguyen, T., Togawa, T., Miele, D. B., Scholer, A. A., & Fujita, K. (2019). A cross-cultural investigation of metamotivational beliefs about promotion vs. prevention. *Manuscript in preparation*.
- Nguyen, T., Togawa, T., Scholer, A. A., & Fujita, K. (2019). A cross-cultural investigation of metamotivational knowledge of construal level in the United States and Japan. *Manuscript under review*.
- Norman, E., Price, M. C., Duff, S. C. (2010). Fringe consciousness: A useful framework for clarifying the nature of experience-based feelings. In Efklides, A., Misailidi, P. (Eds.), *Trends and prospects in metacognition research* (pp. 63–80). New York, NY: Springer.
- Pintrich, P. R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory into Practice*, 41, 219–225. https://doi.org/10.1207/s15430421tip4104_3
- Pham, L. B., & Taylor, S. E. (1999). From thought to action: Effects of process-versus outcome-based mental simulations on performance. *Personality and Social Psychology Bulletin*, 25(2), 250-260.

- Posner, M. I., & Rothbart, M. K. (1998). Attention, self-regulation and consciousness. *Philosophical Transactions of the Royal Society of London: Biological Sciences*, 353, 1915–1927.
- Reber, A. S. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General*, 118(3), 219-235.
- Ricco, R. B. (2015). The development of reasoning. In L. S. Liben, U. Mueller, & R. M. Lerner (Eds.), *Handbook of child psychology and developmental science: Cognitive processes* (7th ed., Vol. 2, pp. 519–570). Hoboken, NJ: John Wiley & Sons.
- Rodriguez, M. L., Mischel, W., & Shoda, Y. (1989). Cognitive person variables in the delay of gratification of older children at risk. *Journal of Personality and Social Psychology*, 57(2), 358-367.
- Ross, J., Nguyen, T., Scholer, A. A., Fujita, K., & Miele, D. B. (2019). Regulatory focus metamotivational knowledge predicts performance. *Manuscript in preparation*.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78.
<http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1037/0003-066X.55.1.68>
- Sansone, C. (2009). What's interest got to do with it?: Potential trade-offs in the self-regulation of motivation. In J. P. Forgas, R. F. Baumeister, & D. M. Tice (Eds.), *Psychology of self-regulation: Cognitive, affective, and motivational processes* (pp. 35–51). New York, NY, US: Psychology Press.
- Sansone, C., & Thoman, D. B. (2005). Interest as the missing motivator in self-regulation. *European Psychologist*, 10(3), 175–186. <https://doi.org/10.1027/1016-9040.10.3.175>

- Sansone, C., & Thoman, D. B. (2006). Maintaining activity engagement: Individual differences in the process of self-regulating motivation. *Journal of Personality, 74*, 1697–1720.
<https://doi.org/10.1111/j.1467-6494.2006.00425.x>
- Sansone, C., Wiebe, D. J., & Morgan, C. (1999). Self-regulating interest: The moderating role of hardiness and conscientiousness. *Journal of Personality, 67*, 701–733.
<https://doi.org/10.1111/1467-6494.00070>
- Sansone, C., Weir, C., Harpster, L., & Morgan, C. (1992). Once a boring task always a boring task? Interest as a self-regulatory mechanism. *Journal of Personality and Social Psychology, 63*(3), 379–390.
- Schmeichel, B. J., Vohs, K. D., & Duke, S. C. (2011). Self-control at high and low levels of mental construal. *Social Psychological and Personality Science, 2*(2), 182–189.
<http://dx.doi.org.proxy.lib.uwaterloo.ca/10.1177/1948550610385955>
- Scholer, A. A., Hartman, O., Hubley, C., Wilson, M., & Henderson, H. A. (2019).
Metamotivational beliefs in children. *Unpublished data.*
- Scholer, A. A., & Higgins, E. T. (2012). Too much of a good thing? Trade-offs in promotion and prevention focus. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 65–84). New York, NY: Oxford University Press.
- 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, 27*(6), 437–442.

- Scholer, A. A., Ozaki, Y., & Higgins, E. T. (2014). Inflating and deflating the self: Sustaining motivational concerns through self-evaluation. *Journal of Experimental Social Psychology, 51*, 60–73. <https://doi.org/10.1016/j.jesp.2013.11.008>
- Schwinger, M., & Otterpohl, N. (2017). Which one works best? Considering the relative importance of motivational regulation strategies. *Learning and Individual Differences, 53*, 122–132. <https://doi.org/10.1016/j.lindif.2016.12.003>
- Schwinger, M., Steinmayr, R., & Spinath, B. (2009). How do motivational regulation strategies affect achievement: Mediated by effort management and moderated by intelligence. *Learning and Individual Differences, 19*, 621–627. <https://doi.org/10.1016/j.lindif.2009.08.006>
- 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.
- Seibt, B., & Förster, J. (2004). Stereotype Threat and Performance: How Self-Stereotypes Influence Processing by Inducing Regulatory Foci. *Journal of Personality and Social Psychology, 87*(1), 38–56. <https://doi.org/10.1037/0022-3514.87.1.38>
- Semin, G. R., & Fiedler, K. (1988). The cognitive functions of linguistic categories in describing persons: Social cognition and language. *Journal of Personality and Social Psychology, 54*(4), 558–568.
- Semin, G. R., Higgins, E. T., de Montes, L. G., Estourget, Y., & Valencia, J. F. (2005). Linguistic signatures of regulatory focus: How abstraction fits promotion more than prevention. *Journal of Personality and Social Psychology, 89*(1), 36–45. <https://doi.org/10.1037/0022-3514.89.1.36>

- Smith, J. L., Wagaman, J., & Handley, I. M. (2009). Keeping it dull or making it fun: Task variation as a function of promotion versus prevention focus. *Motivation and Emotion, 33*, 150–160. <https://doi.org/10.1007/s11031-008-9118-9>
- Smith, P. K., Wigboldus, D. H., & Dijksterhuis, A. P. (2008). Abstract thinking increases one's sense of power. *Journal of Experimental Social Psychology, 44*(2), 378–385.
- Swinkels, A., & Giuliano, T. A. (1995). The measurement and conceptualization of mood awareness: Monitoring and labeling one's mood states. *Personality and Social Psychology Bulletin, 21*(9), 934–949.
- Tamir, M. (2009). What do people want to feel and why?: Pleasure and utility in emotion regulation. *Current Directions in Psychological Science, 18*(2), 101–105.
<http://dx.doi.org/10.1111/j.1467-8721.2009.01617.x>
- Tamir, M., & Ford, B. Q. (2012). When feeling bad is expected to be good: Emotion regulation and outcome expectancies in social conflicts. *Emotion, 12*(4), 807–816.
<http://dx.doi.org/10.1037/a0024443>
- Tamir, M., Mitchell, C., & Gross, J. J. (2008). Hedonic and instrumental motives in anger regulation. *Psychological Science, 19*(4), 324–328. <http://dx.doi.org/10.1111/j.1467-9280.2008.02088.x>
- Thoman, D. B., Sansone, C., Robinson, J. A., & Helm, J. L. (in press). Implicit theories of interest regulation. *Motivation Science*.
- Thoman, D. B., Smith, J. L., & Silvia, P. J. (2011). The Resource Replenishment Function of Interest. *Social Psychological and Personality Science, 2*(6), 592–599.
<https://doi.org/10.1177/1948550611402521>

- Trope, Y., & Fishbach, A. (2000). Counteractive self-control in overcoming temptation. *Journal of Personality and Social Psychology*, 79(4), 493-506.
- Trope, Y., & Liberman, N. (2000). Temporal construal and time-dependent changes in preference. *Journal of Personality and Social Psychology*, 79(6), 876–889.
- Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological review*, 117(2), 440-463.
- Vallerand, R. J., Pelletier, L. G., Blais, M. R., Briere, N. M., Senecal, C., & Vallieres, E. F. (1992). The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educational and Psychological Measurement*, 52(4), 1003-1017.
- Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., & Lens, W. (2009). Motivational profiles from a self-determination perspective: The quality of motivation matters. *Journal of Educational Psychology*, 101, 671–688. <https://doi.org/10.1037/a0015083>
- 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.
- Wakslak, C., & Trope, Y. (2009). The effect of construal level on subjective probability estimates. *Psychological Science*, 20(1), 52-58.
- Weiner, B. (1991). Metaphors in motivation and attribution. *American Psychologist*, 46(9), 921-930.
- Wimperis, B. R., & Farr, J. L. (1979). The Effects of Task Content and Reward Contingency Upon Task Performance and Satisfaction1. *Journal of Applied Social Psychology*, 9(3), 229–249. <https://doi.org/10.1111/j.1559-1816.1979.tb02708.x>

- Wolters, C. A. (1998). Self-regulated learning and college students' regulation of motivation. *Journal of Educational Psychology, 90*, 224–235.
<https://doi.org/10.1037/0022-0663.90.2.224>
- Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist, 38*(4), 189-205.
- Wolters, C. A. (2011). Regulation of motivation: Contextual and social aspects. *Teachers College Record, 113*, 265–283.
- Wolters, C. A., & Benzon, M. B. (2013). Assessing and predicting college students' use of strategies for the self-regulation of motivation. *The Journal of Experimental Education, 81*, 199–221. <https://doi.org/10.1080/00220973.2012.699901>
- Wolters, C. A., & Rosenthal, H. (2000). The relation between students' motivational beliefs and their use of motivational regulation strategies. *International Journal of Educational Research, 33*, 801–820. [https://doi.org/10.1016/s0883-0355\(00\)00051-3](https://doi.org/10.1016/s0883-0355(00)00051-3)
- 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>
- Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process goals to outcome goals. *Journal of Educational Psychology, 89*(1), 29-36.