The Role of Metamotivation in Managing the Motivation of Others: A Leadership Perspective

by

Erik Jansen

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Arts

in

Psychology

Waterloo, Ontario, Canada, 2019

Author's Declaration

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

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

Abstract

A central challenge faced by leaders is effectively managing the motivation of others. Integrating past research on leadership, motivation, and regulatory focus theory, I propose that *metamotivation*—the process of monitoring and controlling motivational states during goal pursuit (Scholer, Miele, Murayama, & Fujita, 2018)—plays an important role in managing the motivation of others. Metamotivation research to date has focused on how people manage their own motivation, while past leadership and motivation research has tended to examine how leaders affect the motivation of followers in relatively passive ways, or the benefits and costs of leaders encouraging a single type of motivation across situations. Using a regulatory focus (Higgins, 1997) framework, I extend metamotivation beyond the context of the self and explore leaders' metamotivational knowledge of how to flexibly manage the motivations of others. Four studies ($N = 882$) investigate whether leaders possess accurate metamotivational knowledge of how to actively and flexibly manage the motivation of followers in response to changing situational and task demands. Results revealed that leaders have accurate knowledge of how follower motivational orientations fit with different tasks (Study 1 and 2), and accurate knowledge of how to induce motivational states in followers in both a close-ended paradigm (Study 3) and an open-ended, spontaneous generation paradigm (Study 4). By highlighting the role of metamotivational knowledge in leadership, this research offers new insights into how people can more effectively manage the motivation of others.

Acknowledgements

I would like to express my sincere gratitude to my supervisor, Dr. Abigail Scholer, for her wisdom, guidance, encouragement, and endless support. She has shown me what it means to be a true scientist, and I am extremely thankful to have her as a mentor and role model. I also thank Dr. Hilary Bergsieker for constantly encouraging me to go above and beyond what I believe I am capable of, and thank Dr. Douglas Brown for his insightful and thoughtful feedback. Lastly, I thank Dr. David Miele and Dr. Kentaro Fujita for all of their incredible advice and feedback.

I am also very grateful for the endless support of the social psychology faculty, Department of Psychology, and my fellow graduate students. In particular, I would like to thank Alex H., Candice H., Chris L., Emily B., Franki K., Jessica R., Sherman K., Tina N., and Yourie K. for being amazing friends and colleagues. Finally, I would like to thank my parents, Cornelis and Geertje Jansen, and all my friends both near and far for providing me with endless love and support as I pursue my goals.

Table of Contents

List of Tables

List of Figures

CHAPTER ONE: INTRODUCTION

Leadership and how to cultivate it has been a long-standing concern. Great leaders allow us to reach our full potential, while poor leaders impair our quality of life (Hogan & Kaiser, 2005). Every day, leaders are faced with the challenge of motivating others in the right ways for the right situations, and making sure people pursue the goals for which they will be most successful. Coaches need to inspire players to achieve new heights in one moment, and then ensure they vigilantly maintain defence the next. Teachers need to motivate students to think big when brainstorming ideas for science fair projects, and then encourage them to be concrete when conducting experiments. Similarly, managers need to assign employees to the tasks best suited to their individual profiles, making sure the right employees develop new products, and that the right employees screen them during quality control. However, up to 75% of employees rate their boss as the worst part of their job (Hogan & Kaiser, 2005), only 15% of people worldwide feel engaged with their work, and 70% of their engagement is attributed to workplace leaders (Gallup, 2017). Given the motivational challenges leaders face, and the widespread dissatisfaction with leaders, investigations of what contributes to the effective management of the motivations of others remains a pressing question.

The present research goes beyond past work that has often highlighted the benefits or costs of one particular style of motivation management, and instead takes seriously the idea that effective leadership involves knowledge of how to actively and flexibly manage the motivation of others in response to changing situational and task demands. In particular, I propose that *metamotivation*—the processes involved in monitoring and controlling motivation during goal pursuit (Scholer et al., 2018)—plays an important role in managing the motivation of others, and

explore whether leaders have this type of knowledge, specifically in the context of managing the eager and vigilant motivational states of followers (Higgins, 1997).

<div align="center">**Leadership and Motivation**</div>

Past work on leadership and motivation has focused on two broad areas, specifically examining motivational *quantity* and *quality*. Quantitative aspects of motivation are concerned with the overall amount of motivation and methods for increasing the amount of motivation people have for goal pursuit. These approaches emphasize that once people become sufficiently motivated (i.e., have the right *amount* of motivation), performance will improve and goals will be successfully achieved (e.g., Locke & Latham, 2006; Schwinger & Otterpohl, 2017; Wolters, 1998). Qualitative aspects of motivation, in contrast, are concerned with different types of motivation and their effect on goal pursuit. For example, being motivated because one is inherently interested in a task is qualitatively different from being motivated because one wishes to receive a cash reward (Ryan & Deci, 2000). Within leadership domains, past work has considered how leaders can encourage beneficial types of motivation to help followers achieve their goals (Mageau & Vallerand, 2003), while other work instead emphasizes the benefits of matching the motivational styles of leaders and followers (Johnson et al., 2017a). These different methods of managing the motivation of followers—quantity and quality—are discussed in more detail below.

First, prior work has considered quantitative aspects of motivation by investigating methods leaders can use to increase the amount of motivation in followers. For example, goal setting theory (Locke & Latham, 1990) shows that by setting specific goals and standards, goals are more readily achieved because individuals become more motivated to pursue the goal in question, plan behaviour, and increase their goal commitment (Locke & Latham, 2002; 2006).

Goal setting is particularly beneficial the more difficult and complex tasks become and is a reliable predictor of individual and group performance (Kleingeld, van Mierlo, & Arends, 2011; Locke & Latham, 2002). Within leadership contexts, when leaders set specific goals and standards for performance, followers' motivation to pursue such goals is increased by directing attention and effort to the specific goal(s) in question over others (Berson, Halevy, Shamir, & Erez, 2015).

Despite these benefits, this approach pays less attention to qualitative aspects of motivation: the relative benefit of different types of motivation in the successful pursuit of different goals (e.g., being vigilant instead of eager when avoiding mistakes). In addition to increasing follower motivation by setting goals, leaders and followers may show increased performance when leaders consider the effects of different kinds of motivation on goal pursuit. Research in sports psychology, for example, has examined the role of self-determination theory (SDT; Ryan & Deci, 2000) in coaching. SDT proposes that goal pursuit is driven by both intrinsic and extrinsic motivation; intrinsic motivation refers to pursuing goals or activities because of inherent interest and satisfaction, whereas extrinsic motivation refers to pursuing goals or activities because of external influences (Ryan & Deci, 2000). A significant body of work demonstrates the beneficial role of intrinsic motivation for performance and well-being in many contexts (Deci & Ryan, 2012; Patall, Cooper, & Robinson, 2008), including leadership. For example, research in sports psychology has demonstrated the benefits of encouraging intrinsic motivation in athletes through coaching (Mageau & Vallerand, 2003). Specifically, when coaches display autonomy-supportive behaviours that allow athletes to develop and address core psychological needs, intrinsic motivation to engage in sports is increased, resulting in increased athletic performance (Gillet, Vallerand, Amoura, & Baldes, 2010). While this work

highlights the need to consider qualitative aspects of motivation in leadership, it tends to adopt a "one size fits all" approach, emphasizing the universal benefits of one type of qualitative motivation.

A third stream of research also examines the role of motivational quality, but emphasizes that motivational fit between leaders and followers is most important (e.g., when leaders and followers are both motivated by the pursuit of ideals; Kark & Van Dijk, 2007; Sassenberg & Hamstra, 2017). Indeed, when an individual's strategic means of goal pursuit is congruent with (i.e., "fits") their underlying motivational orientation, they experience value beyond the outcome of goal pursuit—a phenomenon known as regulatory fit (Higgins, 2005). Experiencing regulatory fit is associated with increased motivational strength (Forster, Higgins, & Idson, 1998), and increased enjoyment and perceived success in goal pursuit (Freitas & Higgins, 2002; Higgins, 2000). Past work on leadership and fit shows that leaders passively encourage followers to match their own motivational orientations through leader behaviours (e.g., Johnson et al., 2017a). For example, when leaders use charisma and inspirational motivation to pursue their ideals (Bass, 1985; Higgins, 1997), followers are more likely to become similarly motivated (Hamstra, Sassenberg, Van Yperen, & Wisse, 2014; Johnson et al., 2017a). In contrast, when leaders closely monitor performance and utilize corrective actions to avoid losses (Bass, 1985; Higgins, 1997), followers will also become similarly motivated (Hamstra et al., 2014a; Johnson et al., 2017a). In this relatively passive process, once fit is established followers feel more valued and evaluate leaders more positively (Hamstra et al., 2014a; Hamstra, Van Yperen, Wisse, & Sassenberg, 2014), and leader-follower relationships are improved (Johnson et al., 2017b). However, similar to research in sports psychology outlined earlier, this approach also tends to

adopt a "once size fits all" approach since leaders passively encourage followers to adopt a single motivational orientation (i.e., their own).

Importantly, these three approaches to leadership and motivation show clear benefits for both leaders and followers. Each approach, however, highlights different ways that leaders can be effective by promoting one particular approach: a focus on motivational quantity over quality, a focus on specific types of motivational orientations, and a focus on fit between leaders and followers. However, one of the challenges that leaders commonly face is to prepare followers for changing demands and conditions that may often be best met by distinct motivational orientations. For example, when developing a new product, leaders need to consider both how much motivation employees need and the different kinds of motivation necessary to develop and complete the product (e.g., being eager to develop an innovative new product, then being vigilant to ensure the product will work as planned). I argue that one method of addressing these motivational challenges is to explore the role of metamotivational knowledge in leadership. Specifically, I consider whether leaders have knowledge of how to flexibly shift the motivation of others based on followers' motivational orientations and situational/task demands.

Metamotivation

Emerging evidence suggests people possess some accurate knowledge of how to regulate both motivational quantity and motivational quality—known as *metamotivation.* Integrating research from cognitive, developmental, educational, and social psychology, metamotivation is the process by which individuals monitor and control their motivational states during goal pursuit (Miele & Scholer, 2018; Scholer & Miele, 2016; Scholer et al., 2018). Using insights from work on metacognition (Flavell, 1979; Pintrich, 2002), metamotivation suggests that effective self-regulation involves both task and strategy knowledge (Scholer et al., 2018). *Task*

knowledge encompasses the knowledge and beliefs people have about how qualitatively different motivational states (e.g., eagerness versus vigilance) impact task performance. For example, knowing that an eager motivational state is beneficial for performance on tasks such as brainstorming demonstrates accurate metamotivational task knowledge. *Strategy knowledge* encompasses knowledge of how to induce a particular motivational state, such as how to induce a vigilant motivational state to avoid mistakes (Miele & Scholer, 2018). Importantly, these different types of knowledge can be tacit or implicit (Wagner & Sternberg, 1985; Wagner, 1987; Reber, 1989), meaning that individuals may be able to effectively regulate their motivation without being able to spontaneously and explicitly articulate the process. Metamotivation proposes that successful self-regulation involves the ability to flexibly activate and use these different forms of knowledge to ensure the "right" motivational state/orientation is used for the "right" task, thereby creating *task-motivation fit* (Scholer et al., 2018).

Initial metamotivation research by Scholer and Miele (2016), for instance, found that people have some accurate metamotivational knowledge of task-motivation fit using a regulatory focus framework. Regulatory focus theory distinguishes between two primary motivational systems, promotion and prevention, that serve distinct but necessary survival needs and that vary both chronically and situationally (Higgins, 1997). Predominantly promotion-focused individuals represent their goals as hopes and aspirations, and are maximally sensitive to the presence of gains and the absence of non-gains. To achieve their goals, promotion-focused individuals prefer eager strategies of goal pursuit where they approach matches to desired outcomes (gains) and avoid mismatches to undesired outcomes (non-gains; Scholer, Cornwell, & Higgins, 2019). In contrast, predominantly prevention-focused individuals represent their goals as duties and responsibilities, and are maximally sensitive to the absence of losses and the presence of non-

losses. To achieve their goals, prevention-focused individuals prefer vigilant strategies of goal pursuit where they avoid mismatches to undesired outcomes (losses) and approach matches to desired outcomes (non-losses; Scholer et al., 2019).

Furthermore, promotion-focused individuals experience regulatory fit when they use eager strategies that involve enthusiastically approaching matches to desired end-states because these strategies best serve promotion-focused concerns with gains and advancement (Scholer et al., 2019). As such, promotion-focused individuals are better suited for tasks that prioritize creativity, speed, and global perceptions because these tasks benefit from eager approach strategies that prioritize ideals and advancement (Higgins & Cornwell, 2016). In contrast, prevention-focused individuals experience regulatory fit when they use vigilant strategies that involve carefully avoiding mismatches to undesired end-states, since these strategies best serve prevention-focused concerns with obligations and maintaining the status quo (Scholer et al., 2019). As such, prevention-focused individuals are better suited for tasks that prioritize analysis, accuracy, and local perceptions because these tasks benefit from vigilant avoidance strategies that prioritize avoiding loss and maintaining the status quo (Higgins & Cornwell, 2016).

Scholer and Miele (2016) demonstrated that people have some accurate metamotivational knowledge of how promotion and prevention focus differentially influence task-motivation fit. Specifically, participants expected to perform better on eager tasks (e.g., brainstorming) after engaging in activities that induce a promotion-focused state (e.g., recalling hopes and aspirations) and expected to perform better on vigilant tasks (e.g., proofreading) after engaging in activities that induce a prevention-focused state (e.g., recalling duties and responsibilities). Participants also possessed some *in*accurate metamotivational knowledge, such that they

demonstrated a bias towards promotion-focused strategies even when these strategies were less effective (e.g., vigilant tasks such as proofreading).

Overall, metamotivation research to date demonstrates that individuals are sensitive to, and can differentiate between, different motivational states and their impact on task performance—though there is significant variability in the accuracy of metamotivational knowledge (Edwards et al., 2019; Nguyen et al., 2019; Scholer & Miele, 2016). However, metamotivation has thus far only focused on how people manage their *own* motivation. In the present work, I take metamotivation beyond the context of the self and explore how people manage the motivation of *others* using a leadership framework. Thus, this research is the first to consider whether leaders have the metamotivational knowledge to actively and flexibly manage the motivation of others, specifically in the context of regulatory focus theory (Higgins, 1997).

Leadership and Metamotivation

Metamotivation raises multiple distinct questions for managing the motivation of others. First, do people have knowledge of how to create task-motivation fit in others? Second, given the benefits of regulatory fit for both individual goal pursuit (Higgins, 2005) and leader-follower relationships (Johnson et al., 2017b), is accurate metamotivational knowledge in managing the motivation of others associated with better outcomes for both leaders and followers? Third, due to the wide variability in the accuracy of metamotivational knowledge (Edwards et al., 2019; Nguyen et al., 2019; Scholer & Miele, 2016), how can we improve accuracy at managing the motivation of others? The present research is the first to consider these questions and address the role of metamotivation in leadership. To this end, this work will specifically explore the first question: do leaders have knowledge of how to create task-motivation fit in others? I address this question by examining leaders' metamotivational task and strategy knowledge.

In the first two studies, I examine leaders' task knowledge in assigning tasks to others based on others' motivational orientations. Doing so will offer insight into leaders' sensitivity to the role that qualitatively different motivational states have on task performance in followers. The remaining two studies examine leaders' strategy knowledge using both close-ended (Study 3) and open-ended, consequential paradigms (Study 4). These studies, in contrast, will provide insight into how leaders prepare others for tasks in order to ensure that followers will experience task-motivation fit using both artificial (Study 3) and realistic (Study 4) paradigms.

Participants and Sample Size

All studies used fully within-participant designs to increase statistical power. Moreover, since a critical component of metamotivation is the ability for individuals to flexibly shift motivational states (Scholer et al., 2018), within-participants designs allow for a clearer demonstration of flexibility. All studies aimed to recruit 200 participants from Amazon's Mechanical Turk (Mturk) in exchange for US$3.00; using TurkPime, only participants whose occupation entails supervision (a clear indication of leadership) were recruited. In Study 3, a sample of undergraduate students was also recruited in exchange for course credit. During and after data collection, Mturk was affected by "bots" or "survey farmers" who provided low quality data (Bai, 2018; TurkPrime, 2018). Thus, in all studies I excluded responses that contained repeating GPS coordinates and/or IP addresses. There were no other exclusion criteria.

As a result, sample size varies across studies even though all studies aimed to recruit 200 participants (see Table 1 for sample characteristics). A sensitivity analysis using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) revealed that, given each study's respective sample size and assuming a correlation between repeated measures of .50 and a non-sphericity correction of 1, the minimum effect size that can be detected at 80% power and $p = .050$ is $\eta_p^2 = .01$.

Table 1

Sample characteristics for Studies 1 – 4.

Study	N	% Female	% Male	% Undeclared	Mdn_{age} (*SD*)	$M_{experience}$ (*SD*)	$M_{subordinates}$ (*SD*)
1	168	45	55	0	33 (9.70)	6.53 (5.74)	9.77 (15.64)
2	153	42.5	57.5	0	35 (10.30)	8.29 (7.68)	9.95 (15.31)
3 (Leaders)	181	51	48	1	36 (10.24)	8.49 (9.28)	9.68 (11.18)
3 (Students)	198	69	30	1	19 (3.03)	4.73 (5.57)	–
4	182	43	57	0	35 (9.60)	7.39 (6.41)	8.77 (15.88)

CHAPER TWO: LEADERS' METAMOTIVATIONAL TASK KNOWLEDGE

Study 1

Study 1 extends beyond past work and is the first to explore metamotivational knowledge in how people manage the motivation of *others* to create task-motivation fit. Specifically, I consider leaders' metamotivational task knowledge (Scholer et al., 2018) by examining whether leaders understand how qualitatively different motivational orientations impact the tasks followers perform in the context of regulatory focus theory (Higgins, 1997). Since people possess metamotivational task knowledge about regulatory focus in regards to the self (Scholer & Miele, 2016), I predict that leaders will also demonstrate metamotivational task knowledge in managing the motivation of others: accurate knowledge of better fit between promotion-focused followers and eager tasks, and prevention-focused followers and vigilant tasks. Further, Study 1 examines whether leaders with more accurate knowledge of how to manage their own motivation also possess more accurate knowledge of how to manage the motivation of others.

Method

Participants were informed that the study investigated how leaders assign tasks to followers and contained two parts. In Part 1, participants were asked to indicate how they would prepare themselves for various tasks to assess their own metamotivational knowledge. I describe that methodology here as this measure is included in all studies; however, as the results on that measure replicate prior work (Scholer & Miele, 2016) and are not the focus of the current research, I report the detailed results for this measure, for all studies, in Appendix K. In Part 2, to assess knowledge of creating task-motivation fit in followers, participants were asked to predict how well employees fit with various tasks based on employees' motivational orientations. Lastly, in this and all subsequent studies, to obtain various estimates of leadership experience

participants were asked to provide demographic information related to their years of leadership experience, the extent of their leadership duties at work on a scale from 1 (*not at all*) to 7 (*very much*), number of subordinates, age, and income.

Self-knowledge assessment. To assess their own metamotivational knowledge, participants completed a knowledge assessment in the form of a recall preference task developed by Scholer and Miele (2016). Specifically, participants were given descriptions of two eager tasks (brainstorming and creative writing) and two vigilant tasks (proofreading and problem-solving tasks) in random order. Immediately following each task description was a set of four recall activities, also presented in random order. Two of these activities are designed to induce a promotion-focused state (e.g., writing about one's hopes and aspirations as a child) and two are designed to induce a prevention-focused state (e.g., writing about one's duties and obligations as a child). Participants were asked to predict how successful they expected to be at each of the four tasks after hypothetically engaging in each activity on a scale from 1 (*not at all*) to 7 (*extremely*; see Appendix A), thereby making a total of 16 predictions. In this paradigm, accurate self-relevant metamotivational knowledge is evidenced by a significant task by recall type interaction, with greater predicted success at eager and vigilant tasks after hypothetically engaging in promotion-focused versus prevention-focused recall activities, respectively.

Employee task-motivation fit. To assess knowledge of how to create task-motivation fit in followers, participants completed an employee assignment task. Participants were told to imagine they were a manager for a real-estate company and were given descriptions of one promotion-focused and one prevention-focused employee. To reduce potential noise, participants

and employee profiles were gender-matched.[1] Participants were told that the real-estate company was approached by a client requesting a design for a new house, and were asked to predict how well qualitatively different aspects of the design fit with each employee (see Appendix B).

Specifically, for the eager task participants were told that an employee needed to design an innovative house that will set new industry standards. Due to its emphasis on advancement and going beyond the status quo, this task is best suited for the promotion-focused employee (Higgins, 2005; Scholer et al., 2019). For the vigilant task, participants were told that an employee needed to ensure the design fit the client's criteria and ensure that the company meets expectations. Due to its emphasis on obligations and avoiding mistakes, this task is best suited for the prevention-focused employee (Higgins, 2005; Scholer et al., 2019).

Individually and in random order, participants were asked to predict how well both the promotion- and prevention-focused employee fit with each task on a five-item measure using a scale from 1 (*not at all*) to 7 (*definitely*; e.g., "I believe that [employee name] would be engaged in the planning and design task"). Thus, participants provided four fit predictions: the eager task + promotion-focused employee ($\alpha = .94$), the eager task + the prevention-focused employee ($\alpha = .94$), the vigilant task + the promotion-focused employee ($\alpha = .93$), and the vigilant task + the prevention-focused employee ($\alpha = .92$). Similar to the recall preference task, accurate knowledge of task-motivation fit in followers is evidenced by a significant task by employee interaction where participants predict greater fit between the promotion-focused employee and the eager task, and the prevention-focused employee and the vigilant task.

---

[1] When gender was entered as a between-participants factor, there were no significant interactions with task type, $F(1, 166) = 1.13$, $p = .290$, $\eta_p^2 < .01$, or employee type, $F(1, 166) = 0.47$, $p = .492$, $\eta_p^2 < .01$. The three-way task, employee, and gender interaction was also not significant, $F(1, 166) = 0.45$, $p = .505$, $\eta_p^2 < .01$. Thus, gender collapsed results are reported.

Results

A two (task type: eager versus vigilant) by two (employee: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task type, $F(1, 167) = 20.11$, $MSE = 0.40$, $p < .001$, $\eta_p^2 = .11$, 90% CI [0.04, 0.18].[2] This main effect showed that participants predicted either employee would fit better with the vigilant task ($M = 5.36$, $SD = 0.89$) than the eager task ($M = 5.13$, $SD = 0.87$), $t(167) = 4.39$, $p < .001$, 95% CI = [0.12, 0.31], $d = 0.35$. There was also a significant main effect of employee motivation, $F(1, 167) = 28.89$, $MSE = 1.43$, $p < .001$, $\eta_p^2 = .15$, 90% CI [0.07, 0.23], such that participants predicted that the promotion-focused employee fit better with both tasks ($M = 5.50$, $SD = 1.03$) than the prevention-focused employee ($M = 5.00$, $SD = 0.99$), $t(167) = 5.38$, $p < .001$, 95% CI = [0.31, 0.68], $d = 0.41$.

As predicted, these main effects were qualified by a significant task by employee interaction, $F(1, 167) = 49.74$, $MSE = 2.53$, $p < .001$, $\eta_p^2 = .23$, 90% CI [0.14, 0.31] (see Figure 1). At the task level, participants predicted that the eager task fit better with the promotion-focused employee ($M = 5.82$, $SD = 1.25$) than the prevention-focused employee ($M = 4.46$, $SD = 1.53$), $t(167) = 8.04$, $p < .001$, 95% CI = [1.03, 1.70], $d = 0.62$. Additionally, participants predicted that the vigilant task fit better with the prevention-focused employee ($M = 5.55$, $SD = 1.12$) than the promotion-focused employee ($M = 5.18$, $SD = 1.36$), $t(167) = 2.73$, $p = .007$, 95% CI = [0.10, 0.64], $d = 0.21$. At the employee level, participants predicted that the promotion-focused employee fit better with the eager task ($M = 5.82$, $SD = 1.25$) than the vigilant task ($M = 5.18$, $SD = 1.36$), $t(167) = 5.23$, $p < .001$, 95% CI = [0.40, 0.89], $d = 0.42$, and predicted that the

---

[2] Because F-tests are one sided and η_p^2 is squared, calculating a 95% confidence interval for η_p^2 can result in situations where the confidence interval contains zero even when the test reveals a significant effect (Lakens, 2014; Steiger, 2004). Since η_p^2 cannot be smaller than zero, I report 90% confidence intervals.

prevention-focused employee fit better with the vigilant task ($M = 5.55$, $SD = 1.12$) than the

eager task ($M = 4.46$, $SD = 1.53$), $t(167) = 7.76$, $p < .001$, 95% CI = [0.81, 1.36], $d = 0.60$.
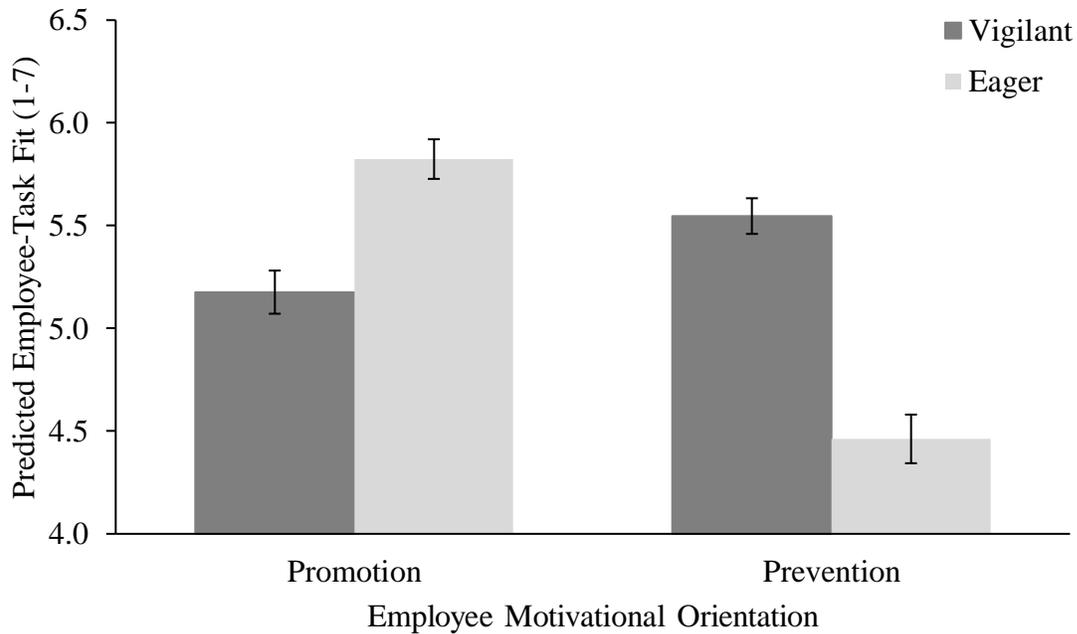
Figure 1. Predicted employee-task fit as a function of employee motivational orientation and task

type (Study 1). Errors bars indicate ± 1 SE.

To determine whether participants demonstrated accurate metamotivational knowledge of

how to create task-motivation fit in followers, an overall accuracy index was computed

([Promotion Employee Fit Prediction for the Eager Task − Prevention Employee Fit Prediction

for the Eager Task] + [Prevention Employee Fit Prediction for the Vigilant Task − Promotion

Employee Fit Prediction for the Vigilant Task]).[3] Higher scores on this index indicate that

participants exhibit accurate metamotivational knowledge by predicting greater fit between the

eager task and the promotion- versus prevention-focused employee, and greater fit between the

vigilant task and the prevention- versus promotion-focused employee fit (Scholer & Miele,

---

[3] Accuracy indices were computed in the same manner for self-relevant metamotivational
knowledge. See Appendix K for a detailed description of these results.

2016). Calculating this index revealed that participants demonstrated overall accuracy in their knowledge of employee task-motivation fit (see Figure 2 and Table 8); however, examining Figure 2 reveals substantial variability in the accuracy of participants' knowledge.
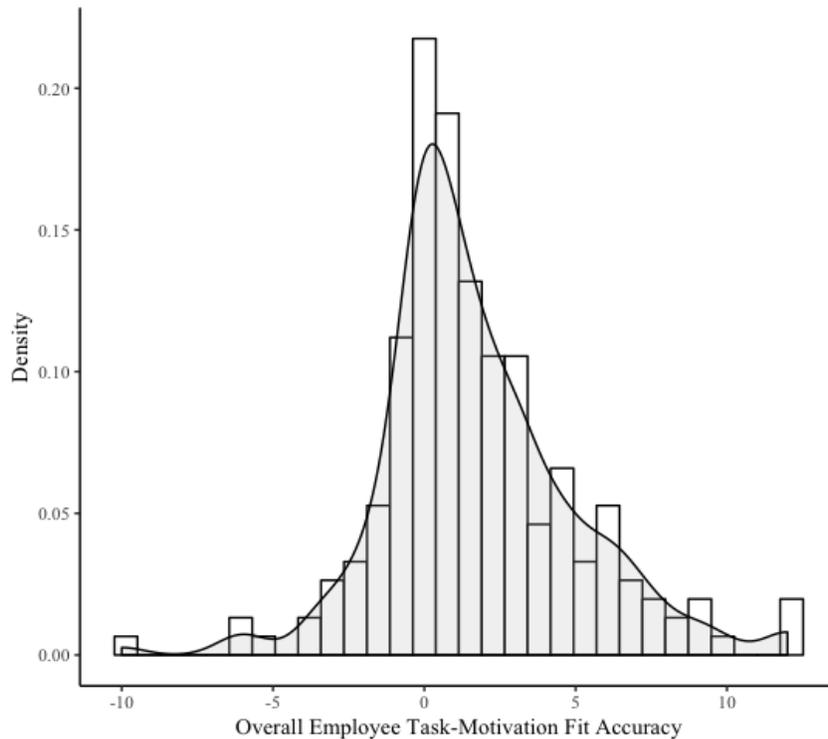
Figure 2. Density plot of overall accuracy in employee task-motivation fit in Study 1.

Self-other association. Positive correlations between self and other accuracy indices would suggest that leaders with more accurate knowledge of how to manage their own motivation also have more accurate knowledge of how to manage the motivations of others. In this study, overall self-relevant metamotivational accuracy was positively correlated with overall employee task-motivation fit accuracy (see Table 2), suggesting that there is at least some association between knowledge of how to manage one's own motivation and the motivation of others. Additionally, I examined associations between participants' demographic characteristics and metamotivational knowledge. Specifically, to determine if leadership experience is associated with greater accuracy in managing the motivation of others, I calculated the

correlation between metamotivational knowledge and years of leadership experience, number of subordinates, and the extent to which participants' occupation requires leadership duties. Other correlations with more indirect measures of experience, such as age and income, were also calculated. Results revealed that leadership experience, as assessed in this study, was largely uncorrelated with accurate knowledge in managing the motivation of both the self and others (see Table 2).

Table 2

Pearson correlations of self-knowledge accuracy, employee task-motivation fit accuracy, and experience (Study 1).

	1	2	3	4	5	6
1. Overall Self Accuracy	–					
2. Overall Employee Accuracy	.26**	–				
3. Years of Experience	.01	.12	–			
4. Extent of Leadership Duties	.05	.09	.27***	–		
5. Number of Subordinates	-.09	-.08	.09	.12	–	
6. Age	.11	.14†	.61***	.12	.01	–
7. Income	.05	.07	.22**	.28***	-.04	.23**

Note: $N = 168$
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Study 1 provides initial evidence that leaders have some accurate metamotivational knowledge in assigning followers to tasks based on the motivational affordances of tasks: participants accurately predicted that a promotion-focused employee would fit better with an eager task, and that a prevention-focused employee would fit better with a vigilant task. Despite this, participants also exhibited significant variability in the accuracy of their knowledge of how to manage the motivation of followers, replicating previous metamotivation research (Edwards et al., 2019; Nguyen et al., 2019; Scholer & Miele, 2016). The moderately positive correlation between overall self-accuracy and overall employee accuracy suggests that leaders with more accurate knowledge of how to manage their own motivation also have more accurate knowledge of how to manage the motivation of others, and that these measures appear to be assessing distinct constructs.

However, other leadership characteristics (e.g., years of experience) were not associated with increased accuracy in managing the motivation of others. On the one hand, the measures

used to assess leadership experience in Study 1 are proxies based on self-report and do not indicate experience in specific types of leadership roles or in particular industries (among other factors); thus, some caution is warranted in interpreting this result. On the other hand, this null result is consistent with past research that suggests relatively weak correlations between experience and leader effectiveness. For instance, a meta-analysis by Hoffman, Woehr, Maldagen-Youngjohn, and Lyons (2011) found that past experience was only weakly associated with overall leader effectiveness. This is not to suggest that experience may not play a role in effective leadership, or the development of metamotivational knowledge. Rather, it is possible that relatively crude measures of experience (e.g., years on the job) do not reflect the types of specific experiences needed to foster this knowledge.

Study 2

Participants in Study 1 predicted that the promotion-focused employee fit better with both eager and vigilant tasks than the prevention-focused employee. This result may reflect the employee descriptions used in the study: participants may have perceived the promotion-focused employee as being more competent and/or more likable than the prevention-focused employee, and therefore predicted better fit with either task. Thus, modified employee profiles were pilot tested to ensure that Study 2 participants perceived each employee as equally likeable and competent. Specifically, participants were asked to rate each employee on their perceived warmth and competence (Cuddy, Fiske, & Glick, 2008), as well as single-item measures of perceived trust and ambition. Results of this pilot testing revealed that the profiles did not differ in warmth, competence, and trust. The only significant difference was in perceived ambition, with the promotion-focused employee perceived as higher in ambition than the prevention-

19

focused employee.[4] Given that promotion-focused individuals are primarily concerned with gains and advancement (Higgins, 1997), perceiving them as more ambitious is in line with prior theorizing. Study 1 participants also predicted that the vigilant task fit either employee better than the eager task. Thus, task descriptions in Study 2 were also modified to minimize such perceptions while still clearly signalling eagerness and vigilance.

Individual differences associated with effective leadership (e.g., extraversion; Hoffman et al., 2011; Judge, Bono, Ilies, & Gerhardt, 2002) were also not measured in Study 1. Thus, it is unknown whether these factors are associated with accuracy in managing the motivation of others. For example, self-monitoring (individual differences in the ability to regulate behaviour in social situations; Snyder, 1974) is associated with effective leadership (Hoffman et al., 2011). Since high self-monitors are especially concerned with how others perceive their actions (Snyder, 1974), leaders high in self-monitoring may be better able to adjust how they manage the motivation of others motivation to ensure the "right" people complete the "right" tasks. Given the robust influence of these individual differences on leadership, Study 2 includes measures to ascertain their association with metamotivational knowledge. Specifically, I included measures of emotional intelligence (Wong & Law, 2002), extraversion, openness to experience, conscientiousness (Judge et al., 2002), and self-monitoring (Snyder, 1974).

Method

Participants first completed the same self-knowledge assessment used in Study 1 (Scholer & Miele, 2016). Afterwards, they completed a similar employee assignment task as Study 1 using the piloted materials. To increase generalizability and in contrast to Study 1, participants in this study were told to imagine they were a project manager for an advertising agency. The

---

[4] Detailed methods and results of the pilot study are presented in Appendices C and D.

agency had been approached by a client requesting a new advertising campaign, and participants were asked to predict how well the two employees fit with different aspects of the project using the same measure as Study 1 (see Appendix E). Because there were no gender differences in Study 1, all participants were randomly assigned to view either male or female employee profiles.[5] Specifically, participants were asked to predict how well one promotion-focused and one prevention-focused employee fit with an eager task (creating an advertising campaign by drafting various alternatives) and a vigilant task (editing the advertisements and making sure they are error-free). Thus, participants again provided four fit predictions: the eager task + promotion-focused employee ($\alpha = .91$), the eager task + the prevention-focused employee ($\alpha = .91$), the vigilant task + the promotion-focused employee ($\alpha = .92$), and the vigilant task + the prevention-focused employee ($\alpha = .88$).

Individual differences. In random order, participants completed the self-monitoring scale ($\alpha = .74$; Snyder, 1974), the extraversion ($\alpha = .83$), openness to experience ($\alpha = .84$), and conscientiousness ($\alpha = .89$) subscales of the Big Five Inventory (BFI; John & Srivastava, 1999), and a measure of emotional intelligence ($\alpha = .93$; Wong & Law, 2002). Individual difference measures were counterbalanced to appear at either the beginning or end of the study.

Results

A two (task: eager versus vigilant) by two (employee: promotion versus prevention) repeated measures ANOVA revealed no significant main effects of task type, $F(1, 152) = 0.37$,

---

[5] When employee gender was entered as a between-participants factor, there were no significant interactions with task type, $F(1, 151) = 0.12$, $p = .729$, $\eta_p^2 < .01$, or employee type, $F(1, 151) = 0.02$, $p = .903$, $\eta_p^2 < .01$. The task type, employee type, and employee gender interaction was also not significant, $F(1, 151) = 0.03$, $p = .858$, $\eta_p^2 < .01$. Thus, employee gender collapsed results are reported.

$MSE = 0.55$, $p = .542$, $\eta_p^2 < .01$, 90% CI [0.00, 0.03], or employee motivation, $F(1, 152) = 0.25$,

$MSE = 0.97$, $p = .619$, $\eta_p^2 < .01$, 90% CI [0.00, 0.03]. As predicted, and replicating Study 1,

there was a significant task by employee interaction, $F(1, 152) = 46.46$, $MSE = 1.54$, $p < .001$,

$\eta_p^2 = .23$, 90% CI [0.14, 0.32] (see Figure 3). Participants predicted that the eager task fit better

with the promotion-focused employee ($M = 5.52$, $SD = 1.04$) than prevention-focused employee

($M = 4.78$, $SD = 1.30$), $t(152) = 5.69$, $p < .001$, 95% CI $= [0.48, 0.99]$, $d = 0.46$. Additionally,

participants predicted that the vigilant task fit better with the prevention-focused employee ($M =$

5.44, $SD = 1.00$) than promotion-focused employee ($M = 4.80$, $SD = 1.32$), $t(152) = 4.99$, $p <$

.001, 95% CI $= [0.38, 0.89]$, $d = 0.40$.

Participants also predicted that the promotion-focused employee fit better with the eager

task ($M = 5.52$, $SD = 1.04$) than the vigilant task ($M = 4.80$, $SD = 1.32$), $t(152) = 6.37$, $p < .001$,

95% CI $= [0.49, 0.94]$, $d = 0.52$. Finally, participants predicted that the prevention-focused

employee fit better with the vigilant task ($M = 5.44$, $SD = 1.00$) than the eager task ($M = 4.78$, SD

$= 1.30$), $t(152) = 5.40$, $p < .001$, 95% CI $= [0.42, 0.89]$, $d = 0.44$.

Employee fit predictions indices were also calculated in the same manner as Study 1.

Replicating those results, participants demonstrated overall accuracy in their employee fit

predictions (see Table 8) and showed significant variability in accuracy (see Figure 4).

Individual differences. The individual difference measures included in this study were

not related to greater accuracy in managing the motivation of others. Additionally, and

replicating Study 1, measures of leadership experience were largely unrelated to accuracy in

managing the motivation of others, though income and age were weakly to moderately positively

associated (see Table 3).
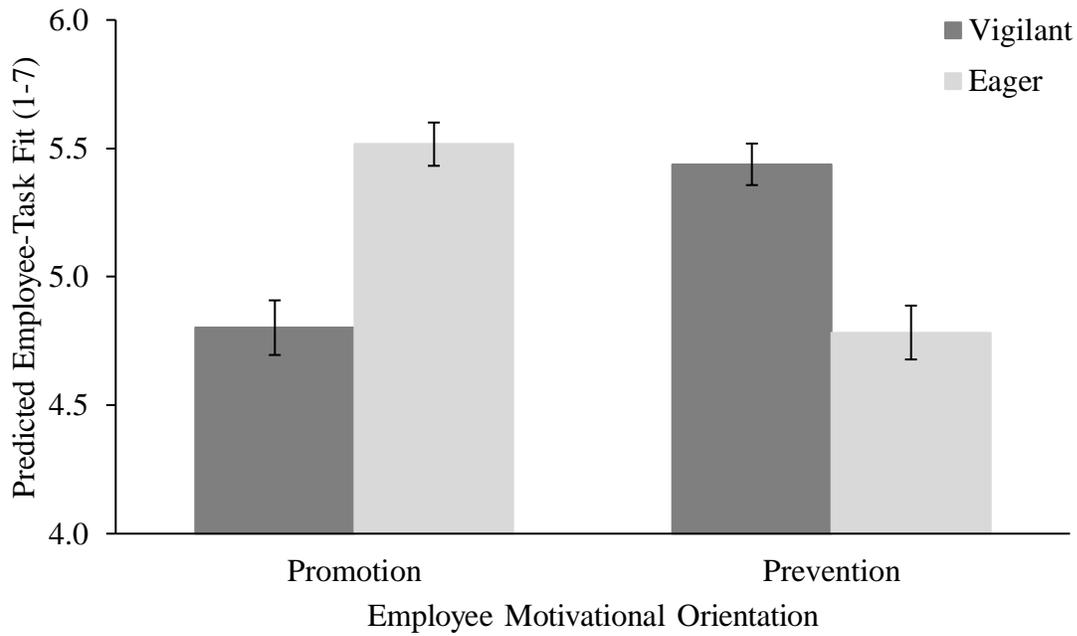
Figure 3. Predicted employee-task fit as a function of task type and employee type (Study 2).

Errors bars indicate ± 1 SE.
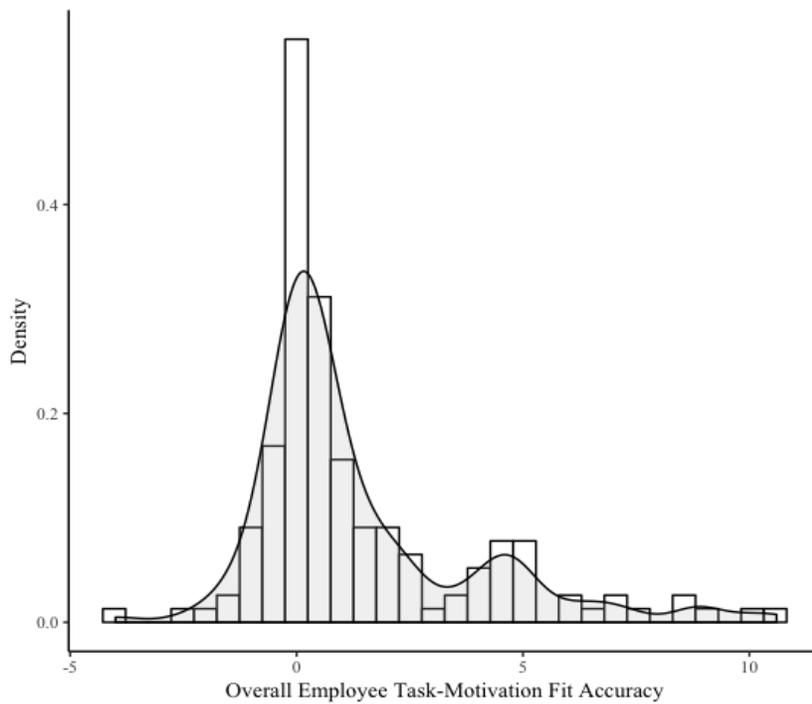
Figure 4. Density plot of overall accuracy in employee task-motivation fit in Study 2.

Table 3

Pearson correlations of individual difference variables, self-knowledge accuracy, employee task-motivation fit accuracy, and experience (Study 2).

	1	2	3	4	5	6	7	8	9	10	11
1. Overall Self Accuracy	–										
2. Overall Employee Accuracy	.29***	–									
3. Extraversion	-.01	-.08	–								
4. Conscientiousness	.05	.11	.14†	–							
5. Openness to Experience	-.15†	.13	.34***	.37***	–						
6. Emotional Intelligence	-.06	.03	.13	.70***	.48***	–					
7. Self-Monitoring	-.04	-.12	.29***	-.25**	-.07	-.17*	–				
8. Years of Experience	.03	.23**	.11	.06	.22**	.03	.00	–			
9. Extent of Leadership Duties	.06	.19*	.21**	.33***	.35***	.28***	-.13	.24**	–		
10. Number of Subordinates	.11	-.03	.06	-.03	.04	-.01	-.11	.00	.18*	–	
11. Age	.07	.16*	-.01	.09	.08	-.03	-.12	.54***	.07	.05	–
12. Income	.10	.20*	.10	.02	-.00	-.06	-.03	.11	.17*	-.02	.01

Note: $N = 153$
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Results of Study 2 replicated those of Study 1 using more refined stimuli. Participants exhibited accuracy in their predictions of how well employees with qualitatively different motivational orientations (promotion and prevention) fit with qualitatively different tasks (eager and vigilant).

Moreover, individual differences often correlated with leadership ability were not significantly related to accurate knowledge of how to manage the motivation of others. Conscientiousness and openness to experience, for instance, are robust predictors of effective

24

leadership (Hoffman et al., 2011; Judge et al., 2002) but were weakly and non-significantly correlated with accurate knowledge of task-motivation fit in others. Extraversion is also related to effective leadership (Judge et al., 2002), but was not associated with increased accuracy of this type of metamotivational knowledge. Since these individual differences are associated with effective leadership at a broad level, they may operate differently in the context of managing the motivation of followers in naturalistic settings. For instance, this research focuses on tasks that benefit from promotion- and prevention-focused states, while in workplace settings leaders need to consider more motivational challenges than the eager versus vigilant aspects of tasks. Thus, perhaps the individual differences measured in this study, such as conscientiousness, are more valuable for other motivational challenges (e.g., knowledge of motivational quantity versus quality).

In contrast to Study 1, however, some measures of experience were associated with increased accuracy in managing the motivation of others. In particular, years of experience and extent of leadership duties were weakly to moderately positively correlated with overall employee task-motivation fit accuracy, suggesting that experience may play a role in fostering sensitivity to qualitive differences in follower motivation. Age and income were also weakly positively correlated with increased employee task-motivation fit accuracy, further hinting at the role experience plays in effectively managing follower motivation. Once more, though, caution is warranted in interpreting these results due to the relatively crude measures of experience that were used; additionally, other studies in this research do not find significant associations between experience and accuracy in managing follower motivation. Thus, the correlations observed in this study may be anomalous. Taken together, Studies 1 and 2 demonstrate that leaders possess

accurate knowledge of the types of tasks that best fit followers based on followers' motivational orientations and task demands.

Nevertheless, the context used in Studies 1 and 2 only inform successful management of others' motivation in one leadership domain. They demonstrate that leaders are sensitive to follower motivational orientations and have the metamotivational task knowledge (Scholer et al., 2019) needed to create task-motivation fit followers within a regulatory focus framework. However, leaders may not always be able to match the "right" follower to the "right" task. In some situations, leaders need to *prepare* followers for tasks by inducing particular motivational states. Indeed, adequately preparing for goal pursuit and the successful completion of various tasks also requires knowledge of how to *induce* motivational states (Miele & Scholer, 2018; Scholer et al., 2018; Wolters, 2003). Furthermore, when pursuing collective goals people attempt to maximize outcomes for the group (Fishbach & Tu, 2016); thus, in addition to ensuring fit between others' motivational orientations and tasks (i.e., Studies 1 and 2), another potential method for maximizing the outcomes of collective goal pursuit may be to ensure that people are appropriately and adequately prepared for tasks. Study 3 investigates whether leaders have knowledge of how to flexibly do so—in other words, do leaders have knowledge of how to induce motivational states in others based on task demands?

CHAPER THREE: LEADERS' METAMOTIVATIONAL STRATEGY KNOWLEDGE

Study 3

Study 3 seeks to extend the findings of Studies 1 and 2 by investigating whether leaders also possess accurate metamotivational *strategy* knowledge— knowledge of how to induce motivational states in others for a particular task (Miele & Scholer, 2018; Scholer et al., 2018.; Wolters, 2003). Moreover, past research (e.g., Hamstra et al., 2014a; Johnson et al., 2017a) pays less attention to how leaders consider the motivational demands of tasks when they manage followers. Study 3 extends this past work by considering whether leaders have knowledge of how to induce motivational states in followers given the motivational demands of a task in order to create task-motivation fit for followers.

Study 3 also investigates how these effects translate to non-leader populations by recruiting a sample of leaders and non-leaders (undergraduate students). If the leader sample demonstrates more accurate knowledge of how to induce motivational states in others than the undergraduate sample, this may suggest that explicit roles in managing others is advantageous for accurate metamotivational knowledge. In contrast, if similar effects are found in both samples, this may suggest that people can generally can recognize when and how to induce motivational states in others.

Finally, since effective self-regulation is associated with greater well-being (Leyland, Rowse, & Emerson, 2019; van Genugten, Dusseldorp, Massey, & van Empelen, 2017), Study 3 includes a measure of subjective well-being (Diener, Emmons, Larsen, & Griffin, 1985) to determine if greater metamotivational accuracy is also associated with greater well-being. Additionally, because these studies examine metamotivation in an organizational context, I also included a measure of job-related well-being (Van Katwyk, Fox, Spector, & Kelloway, 2000) to

determine if accurate metamotivational knowledge is related to overall well-being and/or well-being at work.

Method

The procedure and materials were identical in both samples. First, participants completed a self-assessment their own metamotivational knowledge (Scholer & Miele, 2016) and were then asked how they would prepare followers for tasks. Participants were given four task descriptions and were asked to predict how successful employees would be at each task after participants used two promotion- and two prevention-focused strategies to prepare employees for the tasks. More specifically, participants received two eager (e.g., advertising) and two vigilant (e.g., quality control) task descriptions. Each task was paired with two promotion- and two prevention-focused strategies, randomly selected out of a possible eight strategies. Each task-strategy combination was presented individually and in random order for a total of 16 employee success predictions. For example, participants were asked to predict how successful an employee would be at advertising after participants motivated them by reminding them of their accomplishments within the company (inducing a promotion focus) and after reminding them to follow company rules and regulations (inducing a prevention focus). Employee success predictions were given on a scale from 1 (*not at all*) to 7 (*extremely*; see Appendix F).

Finally, participants in both samples completed the subjective well-being scale (Diener et al., 1985), a well-validated and robust measure of overall well-being ($\alpha = .92$ for leaders and $\alpha = .90$ for students). Participants also completed the job-related affective well-being scale (Van Katwyk et al., 2000), which measures the extent to which participants felt positive ($\alpha = .95$ for leaders and $\alpha = .90$ for students) and negative emotions ($\alpha = .92$ for leaders and $\alpha = .95$ for students) at work over the past 30 days; for the student sample, items were modified to reflect an

academic context to better fit the lived experiences of the undergraduate students in the sample. Participants in the student sample were also only asked to provide demographic information related to their years of leadership experience (including volunteering), as well as their age.

Results

    Leader sample. A two (task: eager versus vigilant) by two (strategy: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task, $F(1, 180) = 8.38$, $MSE = 0.21$, $p = .004$, $\eta_p^2 = .04$, 90% CI [0.01, 0.10], where participants predicted that employees would perform better at vigilant tasks ($M = 5.51$, $SD = 0.87$) than eager tasks ($M = 5.41$, $SD = 0.89$), $t(180) = 2.89$, $p = .004$, 95% CI [0.03, 0.67], $d = 0.21$. There was also a significant main effect of strategy type, $F(180) = 58.52$, $MSE = 0.62$, $p < .001$, $\eta_p^2 = 0.25$, 90% CI [0.16, 0.33], such that participants predicted that employees would be more successful after being motivated by promotion-focused strategies ($M = 5.68$, $SD = 0.84$) compared to prevention-focused strategies ($M = 5.24$, $SD = 1.02$), $t(180) = 7.65$, $p < .001$, 95% CI [0.33, 0.56], $d = 0.57$.

    These main effects were qualified by a task by strategy interaction, $F(1, 180) = 36.87$, $MSE = 0.30$, $p < .001$, $\eta_p^2 = .17$, 90% CI [0.10, 0.26] (see Figure 6). Examining the simple effects of task revealed that participants predicted that employees would perform better at eager tasks after participants used promotion-focused strategies to motivate them ($M = 5.76$, $SD = 0.86$) compared to using prevention-focused strategies ($M = 5.06$, $SD = 1.18$), $t(180) = 8.95$, $p < .001$, 95% CI [0.54, 0.85], $d = 0.67$. Additionally, participants predicted that employees would perform better at vigilant tasks after participants used promotion-focused strategies to motivate them ($M = 5.60$, $SD = 0.92$) compared to using prevention-focused strategies ($M = 5.41$, $SD = 1.02$), $t(180) = 3.09$, $p = .002$, 95% CI [0.07, 0.33], $d = 0.22$.

Examining the simple effects of strategy revealed that participants predicted employees would perform better after they used promotion-focused strategies to motivate them for eager tasks ($M = 5.76$, $SD = 0.86$) than vigilant tasks ($M = 5.61$, $SD = 0.92$), $t(193) = 3.57$, $p < .001$, 95% CI = [0.07, 0.23], $d = 0.27$. Participants also predicted employees would perform better after they used prevention-focused strategies to motivate them for vigilant tasks ($M = 5.41$, $SD = 1.02$) than eager tasks ($M = 5.06$, $SD = 1.18$), $t(180) = 5.53$, $p < .001$, 95% CI [0.22, 0.47], $d = 0.41$.

Metamotivational strategy accuracy indices were calculated in a similar manner to Study 1 and 2, and revealed that participants demonstrated overall metamotivational strategy accuracy in managing others (see Figure 5 and Table 8). Replicating Studies 1 and 2, accurate self-knowledge was moderately positively associated with accurate knowledge of how to induce motivational states in followers, and measures of leadership experience were unrelated to accurate strategy knowledge (see Table 4). Interestingly, accurate metamotivational self-knowledge and employee strategy knowledge was moderately negatively correlated with overall subjective well-being and positive emotions at work (see Table 4).
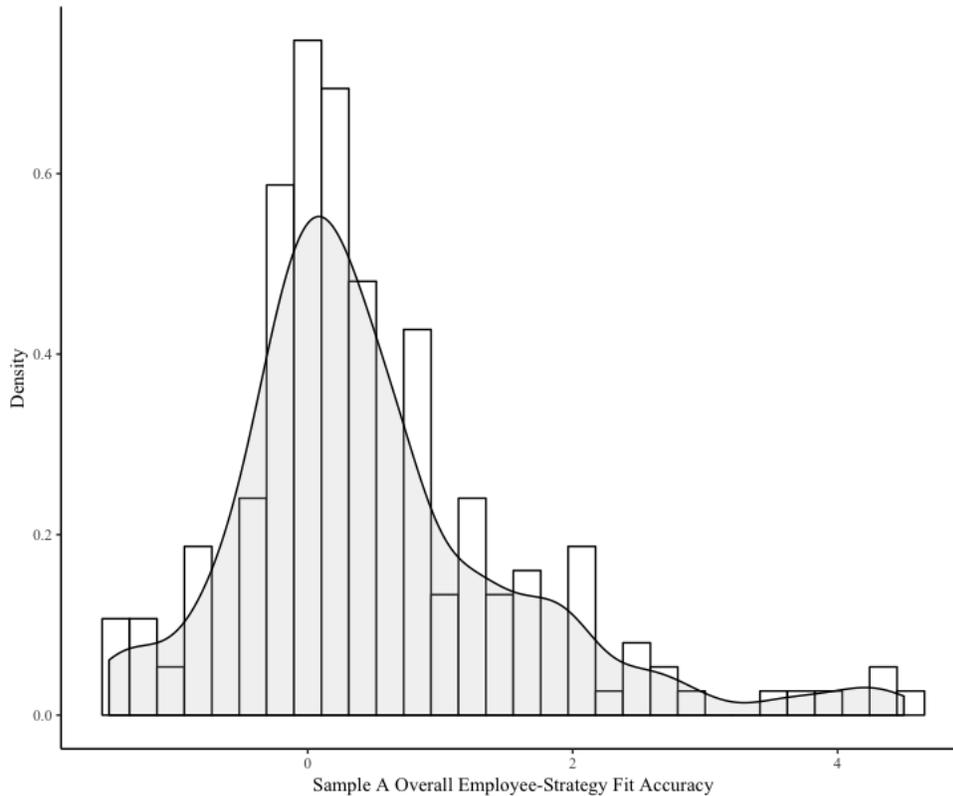
Figure 5. Density plot of overall metamotivational employee-strategy accuracy in Study 4—

Leader Sample.

Student sample. A two (task: eager versus vigilant) by two (strategy: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task, $F(1, 197) = 14.86$, $MSE = 0.21$, $p < .001$, $\eta_p^2 = .07$, 90% CI [0.02, 0.13], where participants predicted that employees would perform better at vigilant tasks ($M = 5.14$, $SD = 0.73$) than eager tasks ($M = 5.02$, $SD = 0.77$), $t(197) = 3.85$, $p < .001$, 95% CI [0.06, 0.19], $d = 0.27$. There was also a significant main effect of strategy type, $F(197) = 67.46$, $MSE = 1.04$, $p < .001$, $\eta_p^2 = 0.26$, 90% CI [0.17, 0.33], such that participants predicted that employees would be more successful after they were motivated by promotion-focused strategies ($M = 5.38$, $SD = 0.74$) compared to prevention-focused strategies ($M = 4.79$, $SD = 0.99$), $t(197) = 8.21$, $p < .001$, 95% CI [0.45, 0.74], $d = 0.58$.

31

These main effects were qualified by a task by strategy interaction, $F(1, 197) = 32.73$, $MSE = 0.29$, $p < .001$, $\eta_p^2 = .14$, 90% CI [0.07, 0.22] (see Figure 6), replicating the leader sample. Examining the simple effects of task revealed that participants predicted employees would perform better at eager tasks after participants used promotion-focused strategies to motivate them ($M = 5.43$, $SD = 0.78$) compared to using prevention-focused strategies ($M = 4.62$, $SD = 1.13$), $t(197) = 9.60$, $p < .001$, 95% CI [0.65, 0.98], $d = 0.68$. Additionally, participants predicted that employees would perform better at vigilant tasks after participants used promotion-focused strategies to motivate them ($M = 5.34$, $SD = 0.84$) compared to using prevention-focused strategies ($M = 4.96$, $SD = 1.00$), $t(197) = 4.78$, $p < .001$, 95% CI [0.22, 0.53], $d = 0.32$.

Examining the simple effects of strategy revealed that participants predicted employees would perform better after they used promotion-focused strategies to motivate them for eager tasks ($M = 5.43$, $SD = 0.78$) versus vigilant tasks ($M = 5.34$, $SD = 0.84$), $t(197) = 2.04$, $p = .043$, 95% CI = [0.00, 0.18], $d = 0.15$. Participants also predicted employees to perform better after they used prevention-focused strategies to motivate them for vigilant tasks ($M = 4.96$, $SD = 1.00$) versus eager tasks ($M = 4.62$, $SD = 1.13$), $t(197) = 6.38$, $p < .001$, 95% CI [0.24, 0.45], $d = 0.45$.

Accuracy indices revealed that participants exhibited overall metamotivational strategy accuracy (see Figure 7 and Table 8). Also replicating Studies 1 and 2, accurate self-knowledge was moderately positively associated with accurate knowledge of how to induce motivational states in followers, and measures of leadership experience were unrelated to accurate strategy accuracy (see Table 5); however, participants in the student sample had significantly less years of leadership experience than the leader sample, $t(377) = 5.20$, $p < .001$, 95% CI [2.19, 4.93], $d = 0.53$. In contrast to the leader sample, accurate metamotivational strategy knowledge was not

associated with overall subjective well-being and positive emotions at school (see Table 5).

Finally, overall metamotivational strategy accuracy in the student sample did not differ

significantly from the leader sample, $t(377) = 0.54$, $p = .590$, 95% CI [-0.16, 0.28], $d = 0.07$.
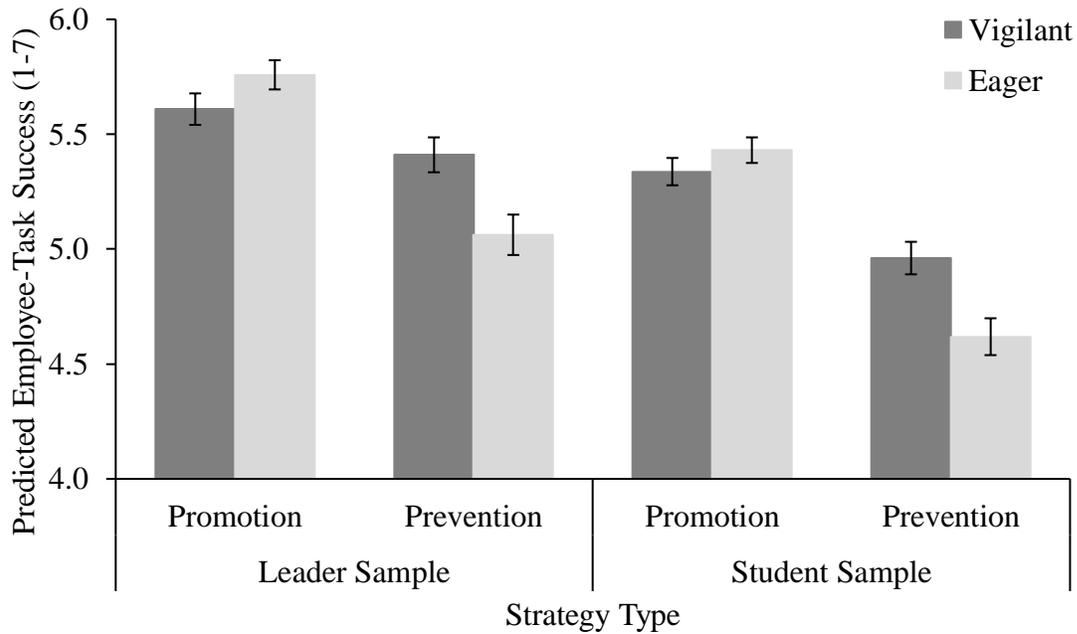
*Figure 6.* Metamotivational strategy knowledge as a function of strategy type and task type

(Study 3). Errors bars indicate ± 1 SE.
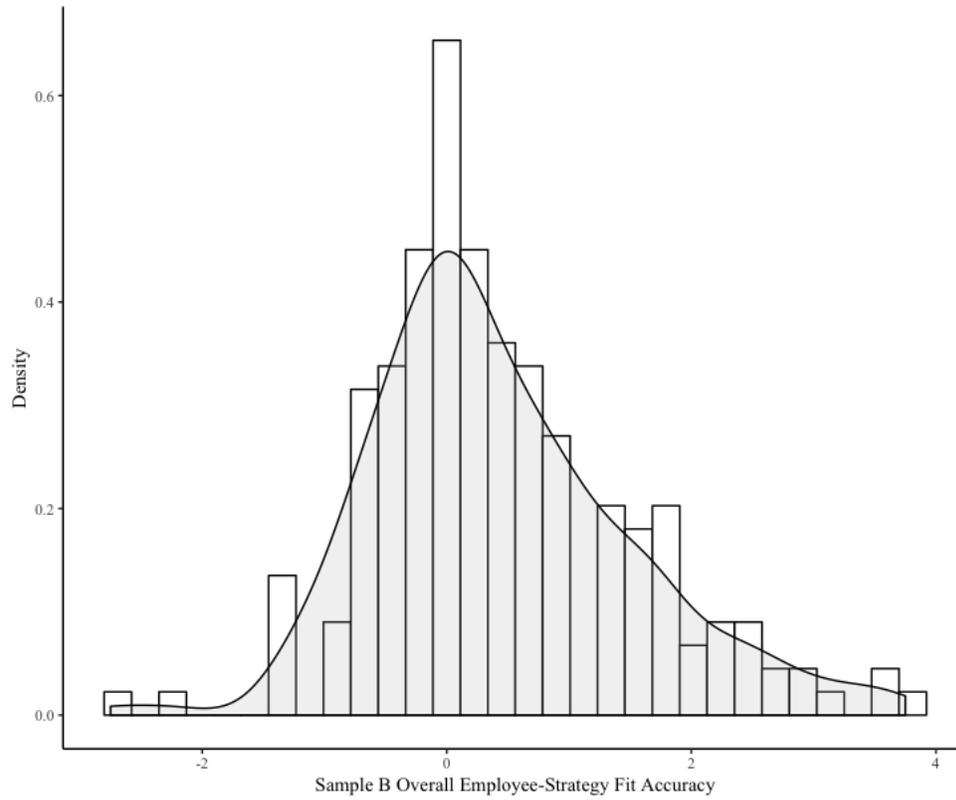
Figure 7. Density plot of overall metamotivational employee-strategy accuracy in Study 4—

Student Sample.

Table 4

Pearson correlations of self-knowledge accuracy, employee task-strategy accuracy, and experience (Study 3, Leader Sample).

	1	2	3	4	5	6	7	8	9
1. Overall Self Accuracy	–								
2. Overall Employee Accuracy	.22**	–							
3. Years of Experience	-.06	-.06	–						
4. Extent of Leadership Duties	.04	-.08	.20**	–					
5. Number of Subordinates	.07	.02	.06	.39***	–				
6. Age	.02	.01	.36***	.14†	.05	–			
7. Income	-.10	-.06	.30***	.22**	.23**	.23**	–		
8. Well-Being	-.21**	-.15*	.07	.14†	.13†	.03	.31***	–	
9. Negative Emotions	-.03	-.02	.03	-.10	-.10	-.14†	-.25***	-.36***	–
10. Positive Emotions	-.13†	-.29***	.20**	.21**	.15*	.10	.18*	.56***	-.36

Note: $N = 198$
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5

Pearson correlations of self-knowledge accuracy, employee task-strategy accuracy, and well-being (Study 3, Student Sample).

	1	2	3	4	5	6
1. Overall Self Accuracy	–					
2. Overall Employee Accuracy	.22**	–				
3. Years of Experience	-.04	-.03	–			
4. Age	-.02	.06	.22**	–		
5. Well-Being	-.07	-.03	-.09	-.04	–	
6. Negative Emotions	-.01	-.01	.09	-.12†	-.38***	–
7. Positive Emotions	-.10	-.04	-.02	.09	.50***	-.42***

Note: $N = 198$
† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

Study 3 extends the findings of Studies 1 and 2 by demonstrating that in addition to task knowledge (Scholer & Miele, 2016; Scholer et al., 2019), leaders also possess some accurate metamotivational strategy knowledge of how to *induce* motivational states in followers to create task-motivation fit. Moreover, this effect was replicated in a non-leader sample of undergraduate students, and there were no significant differences in the accuracy of metamotivational strategy knowledge across the two samples. Participants in the leader sample had significantly more leadership experience than the undergraduate sample, but replicating Study 1 in both samples experience was not associated with accuracy knowledge of how to induce motivational states in others. However, Study 2 did find weak associations with experience and metamotivational task knowledge. Taken together, these results provide mixed evidence for the role of experience in accurate knowledge of managing follower motivation.

Interestingly, there was a negative correlation between metamotivational strategy accuracy, well-being, and positive emotions at work for participants in the leader sample. However, the undergraduate sample did not show any significant correlations between accurate knowledge and well-being. Similar to the correlations between metamotivational accuracy and experience, however, the accuracy indices calculated are not validated measures of objective leader effectiveness, and therefore caution is warranted in interpreting this result. Future research should more fully explore the relationship between metamotivational knowledge and well-being.

We also observed a bias towards favouring strategies that induce a promotion focus. Past work in metamotivation and regulatory focus finds that people hold inaccurate beliefs about the benefits of promotion focus (Scholer & Miele, 2016), and Western samples in general tend to hold biases that favour promotion over prevention (Higgins, 1997; Scholer & Higgins, 2012).

36

Thus, the inaccurate beliefs about the effectiveness of inducing promotion focus in Study 3 may reflect the tendency to favour promotion over prevention in our samples. Indeed, if this promotion bias was at play in both samples, this may also offer insight into why participants were *inaccurate* in their estimates for vigilant tasks. Due to the promotion bias, participants may have inaccurately predicted greater employee success at vigilant tasks after they used promotion-focused strategies to motivate employees.

In managing the motivation of others, the results of Study 3 provide some evidence of metamotivational strategy knowledge, and Studies 1 and 2 provide some evidence of metamotivational task knowledge. By using standardized materials based on existing metamotivation and regulatory focus research (Scholer & Miele, 2016), and the pilot testing of employee profiles in Study 2, the paradigms used thus far have provided relatively robust initial tests of leaders' metamotivational knowledge in managing followers. However, one limitation of these studies is the use of artificial paradigms and hypothetical scenarios, and they do not examine whether or how this knowledge is spontaneously generated. Thus, it is unclear how metamotivational knowledge is implemented in actual leadership settings where it is more difficult to estimate how effective a given strategy would be for motivating others for a given task, or how well a given person would fit with a given task. To alleviate the concerns of using hypothetical paradigms, and begin to investigate how metamotivational knowledge is implemented in realistic settings, Study 4 examines leaders' metamotivational strategy knowledge using an open-ended and consequential paradigm.

Study 4

In Study 4 participants were asked to indicate how they would motivate another participant for eager and vigilant tasks using an open-ended response format. To make the study

more ecologically valid and consequential, participants were told that their responses were going

to actually be used to help the other participant complete tasks in a future study. In reality, the

other participant did not exist and responses were not going to be used in a future study.

Participants also completed the same individual difference measures used in Study 2 to

investigate whether individual differences in leadership influence how people prepare others for

tasks.[6]

Participants' open-ended responses were analyzed using Linguistic Inquiry Word Count

software (LIWC; Pennebaker, Booth, Boyd, & Francis, 2015). LIWC determines the frequency

with which specific words and word phrases that belong to predefined categories are used, and

includes built-in dictionaries and the ability for users to create and upload their own custom

dictionaries. I created a custom dictionary of regulatory focus words (see Appendix H), based on

a dictionary created by Gamache, McNamara, and Johnson (2015). The original word list by

Gamache and colleagues (2015) used an older version of LIWC software that does not allow for

word stems to be counted (e.g., "excite" and "excited" must be entered as individual words), and

contains relatively few promotion and prevention words. My custom dictionary uses the newest

version of LIWC software, allowing for the detection of word stems, and includes and expands

upon the original dictionary created by Gamache and colleagues (2015). Specifically, my

regulatory focus dictionary contains 142 promotion-focused words and word stems (e.g.,

"achiev*" includes achieve and achievement, and their plural and past tense forms) and 145

prevention-focused words and word stems (e.g., "responsib*" includes responsible, responsibly,

---

[6] Replicating Study 2, these measures were largely unrelated to metamotivational strategy
knowledge and are therefore not discussed further. Interested readers can consult Appendix J for
the full correlation table.

responsibility, and responsibilities). The frequency of promotion and prevention focus word use was uncorrelated, $r(180) = -.08$, $p = .282$.

Two potential limitations of using LIWC to analyze open-ended responses were addressed through additional coding by trained human coders (blind to condition). First, since my LIWC dictionary is new, comparative analyses through existing methods can provide evidence to validate results and the dictionary itself. Second, since LIWC only counts the frequency with which particular words or word phrases are used (Pennebaker et al., 2015), responses with greater complexity become more difficult to analyze (e.g., negating particular phrases). Thus, responses were coded by three trained, independent research assistants who were blind to condition. On a scale from 1 (*not at all*) to 5 (*a great deal*), promotion was coded on four dimensions: abstract ($\alpha = .69$), speed ($\alpha = .70$), gains ($\alpha = .72$), and ideals ($\alpha = .69$). Similarly, prevention focus was also coded on four dimensions: concrete ($\alpha = .70$), accuracy ($\alpha = .89$), losses ($\alpha = .89$), and oughts ($\alpha = .69$; see Appendix I for detailed coding scheme). For each regulatory focus, dimensions were averaged across coders and then each regulatory focus was averaged to create composite scores. LIWC and human coded promotion scores were positively correlated, as well as LIWC and human coded prevention scores (see Table 6).

Table 6

Pearson correlations between LIWC and human coded regulatory focus scores.

	1	2	3
1. LIWC Promotion	–		
2. LIWC Prevention	-.08	–	
3. Human Coded Promotion	.37**	.01	–
4. Human Coded Prevention	-.13†	.17*	-.03

Note: $N = 182$
† $p < .10$, * $p < .05$, ** $p < .001$

Method

As in other studies, participants first completed the self-knowledge assessment developed by Scholer and Miele (2016). Participants were then told they were going to prepare another participant to complete various tasks. Specifically, participants were asked to write a response that would be used to help the ostensible participant complete the tasks in a different study. In random order, participants were asked to write a response to prepare another person for two eager (product development and advertising) and two vigilant (financial management and quality control) tasks (see Appendix G). Since each participant provided four open-ended responses, there are a total of 364 responses to both eager and vigilant tasks (728 in total). Afterward, participant provided the same demographic information and leadership experience questions as previous studies.

Results

Using the newly created LIWC dictionary, a two (task: eager versus vigilant) by two (word category: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task, $F(1, 181) = 14.95$, $MSE = 4.90$, $p < .001$, $\eta_p^2 = .08$, 90% CI [0.03, 0.14]. Participants used more regulatory focus words to motivate others for vigilant tasks ($M = 3.11$, $SD = 1.67$) than eager tasks ($M = 2.48$, $SD = 1.64$), $t(181) = 3.87$, $p < .001$, 95% CI [0.31, 0.96], $d = 0.29$. There was also a significant main effect of word category, $F(1, 181) = 16.06$, $MSE = 7.11$, $p < .001$, $\eta_p^2 = .08$, 90% CI [0.03, 0.15], such that participants used more prevention-focused words ($M = 3.19$, $SD = 1.99$) than promotion-focused words ($M = 2.40$, $SD = 1.62$), $t(181) = 4.01$, $p < .001$, 95% CI [0.40, 1.18], $d = 0.30$.

These main effects were qualified by a significant task by word category interaction, $F(181) = 166.69$, $MSE = 5.27$, $p < .001$, $\eta_p^2 = 0.48$, 90% CI [0.39, 0.55] (see Figure 8).

Examining the effects of word category, participants used significantly more promotion-focused words to motivate others for eager tasks ($M = 3.19$, $SD = 1.19$) than vigilant tasks ($M = 1.61$, $SD = 1.75$), $t(181) = 7.24$, $p < .001$, 95% CI [1.15, 2.01], $d = 0.53$. Participants also used significantly more prevention-focused words to motivate others for vigilant tasks ($M = 4.62$, $SD = 3.11$) than eager tasks ($M = 1.77$, $SD = 2.02$), $t(181) = 11.21$, $p < .001$, 95% CI [2.34, 3.35], $d = 0.83$. Conversely, examining the simple effects of task type revealed that for eager tasks, participants used significantly more promotion-focused words to motivate others ($M = 3.19$, $SD = 2.55$) than prevention-focused words ($M = 1.77$, $SD = 2.02$), $t(181) = 5.91$, $p < .001$, 95% CI [0.95, 1.89], $d = 0.44$. Finally, for vigilant tasks, participants used significantly more prevention-focused words to motivate others ($M = 4.62$, $SD = 3.11$) than promotion-focused words ($M = 1.61$, $SD = 1.75$), $t(181) = 10.72$, $p < .001$, 95% CI [2.45, 3.56], $d = 0.79$.
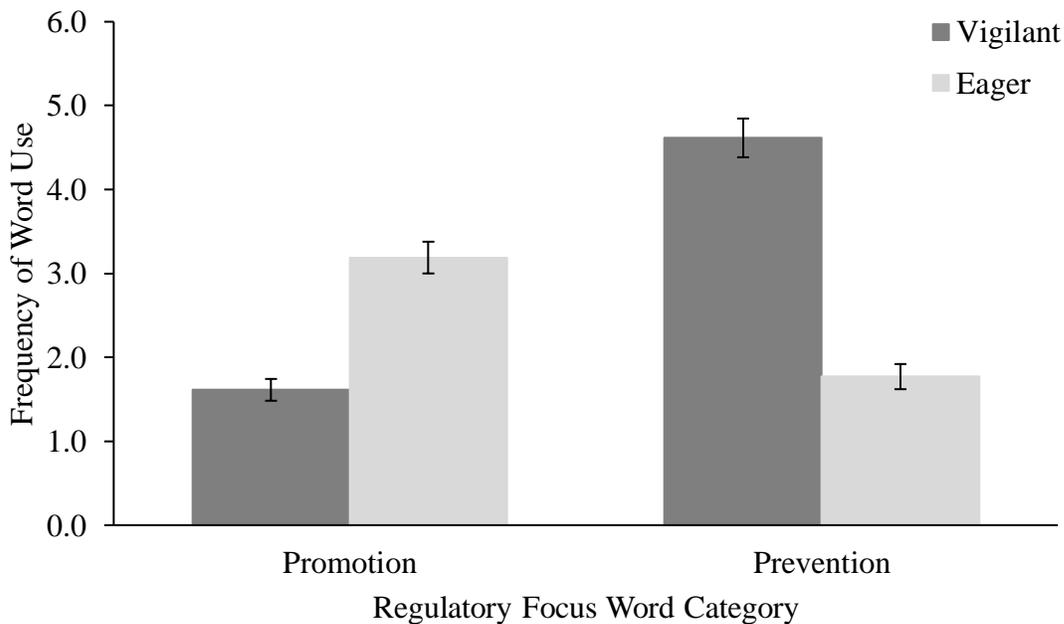
Figure 8. LIWC scored frequency of regulatory focus word use by task type for open-ended strategy responses (Study 4). Errors bars indicate ± 1 SE.

Accuracy indices were again computed, and revealed that participants' open-ended responses exhibited overall metamotivational strategy accuracy (see Figure 9 and Table 8). Notably, the standard deviation for participants' overall metamotivational strategy accuracy is nearly equal to their mean accuracy. Thus, although participants were accurate in their use of promotion- and prevention-focused strategies overall, there was substantial variability in accurate metamotivational strategy knowledge. Finally, experience was once again not associated with increased strategy accuracy (see Table 7).
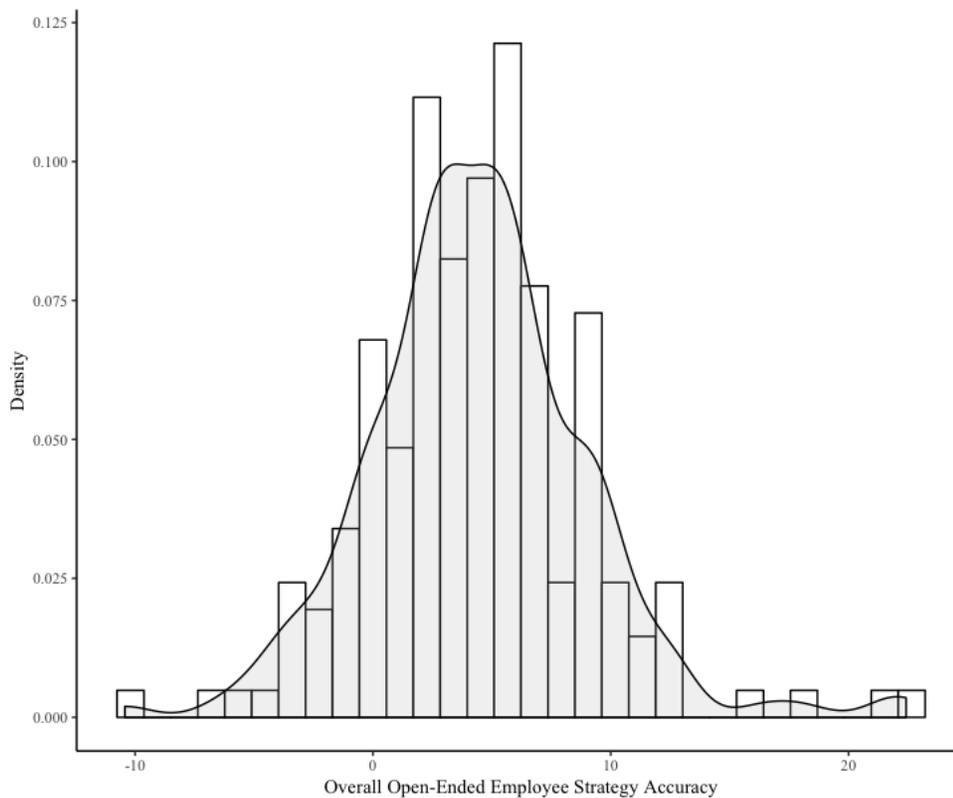
Figure 9. Density plot of overall open-ended metamotivational employee-strategy accuracy in Study 4.

Using the human coded composite scores, a two (task: eager versus vigilant) by two (coded strategy: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task, $F(1, 181) = 11.07$, $MSE = 0.35$, $p = .001$, $\eta_p^2 = .06$, 90% CI [0.01, 0.12].

Participants used more strategies to motivate others for vigilant tasks ($M = 2.28$, $SD = 0.33$) than eager tasks ($M = 2.09$, $SD = 0.29$), $t(181) = 10.44$, $p < .001$, 95% CI [0.16, 0.23], $d = 0.77$. There was also a significant main effect of strategy, $F(181) = 109.02$, $MSE = 0.06$, $p < .001$, $\eta_p^2 = 0.38$, 90% CI [0.29, 0.45], such that participants used more prevention-focused strategies ($M = 2.25$, $SD = 0.47$) than promotion-focused strategies ($M = 2.11$, $SD = 0.34$), $t(181) = 3.33$, $p = .001$, 95% CI [0.06, 0.23], $d = 0.25$.

These main effects were qualified by a significant task by strategy interaction, $F(1, 181) = 964.48$, $MSE = 0.18$, $p < .001$, $\eta_p^2 = .84$, 90% CI [0.81, 0.86] (see Figure 10). Examining the effects of strategy, participants used significantly more promotion-focused strategies to motivate others for eager tasks ($M = 2.50$, $SD = 0.47$) than vigilant tasks ($M = 1.72$, $SD = 0.33$), $t(181) = 25.13$, $p < .001$, 95% CI [0.72, 0.85], $d = 1.86$. Participants also used significantly more prevention-focused strategies to motivate others for vigilant tasks ($M = 2.84$, $SD = 0.68$) than eager tasks ($M = 1.67$, $SD = 0.36$), $t(181) = 28.46$, $p < .001$, 95% CI [1.09, 1.25], $d = 2.11$. Conversely, examining the simple effects of task type revealed that for eager tasks, participants used significantly more promotion-focused strategies to motivate others ($M = 2.50$, $SD = 0.47$) than prevention-focused strategies ($M = 1.67$, $SD = 0.36$), $t(181) = 18.91$, $p < .001$, 95% CI [0.75, 0.92], $d = 1.40$. Finally, for vigilant tasks, participants used significantly more prevention-focused words to motivate others ($M = 2.84$, $SD = 0.68$) than promotion-focused words ($M = 1.72$, $SD = 0.33$), $t(181) = 18.16$, $p < .001$, 95% CI [1.00, 1.24], $d = 1.35$.

Accuracy indices were again computed, and replicated LIWC results by revealing that participants exhibited overall metamotivational strategy accuracy (see Table 8). Further, accuracy indices calculated using LIWC scores were positively correlated with those calculated

using human-coded scores, and leadership experience was again not associated with increased

accuracy at managing the motivation of others (see Table 7).
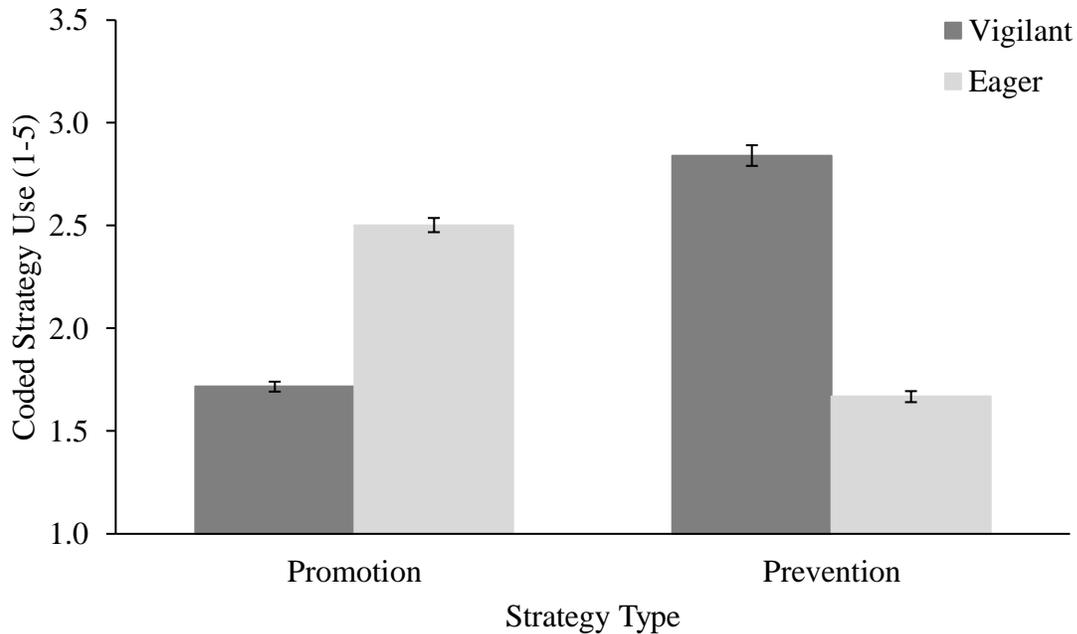
Figure 10. Human-coded frequency of strategy use by task type for open-ended strategy

responses (Study 4). Errors bars indicate ± 1 SE.

Table 7

Pearson correlations between LIWC accuracy, human coded accuracy, and experience (Study

4).

	1	2	3	4	5	6	7
1. Overall Self Accuracy	–						
2. LIWC Overall Accuracy	.10	–					
3. Human Coded Overall Accuracy	.12	.24***	–				
4. Years of Experience	-.12	.03	.08	–			
5. Extent of Leadership Duties	-.10	-.07	.08	.27***	–		
6. Number of Subordinates	-.17*	-.01	.07	.07	.22**	–	
7. Income	-.00	.10	.08	.01	.07	.10	–
8. Age	-.00	-.09	.06	.71***	.12	-.04	-.02

Note: $N = 182$

$^\dagger p < .10$, $^* p < .05$, $^{**} p < .01$, $^{***} p < .001$

Discussion

Using an open-ended and consequential paradigm, the results of Study 4 replicated those of Study 3. Specifically, a custom LIWC dictionary and trained human coders revealed that participants demonstrated accurate knowledge of how to induce motivational states in others based on task demands. The use of a consequential paradigm provides some initial evidence of the implementation of metamotivational knowledge in realistic settings using a regulatory focus framework. Other work on the implementation of metamotivational knowledge in the context of construal level theory (CLT; Trope & Liberman, 2010) demonstrates that people correctly choose to adopt high- versus low-level construal prior to completing tasks that benefit from high- versus low-level construal, respectively (Nguyen et al., 2019). Indeed, the results of Study 4 expand upon this previous work on metamotivation in regards to self (e.g., Nguyen et al., 2019; Scholer & Miele, 2016) and provides evidence for how people manage the motivation of *others* in realistic settings.

Additionally, prior work on leadership and regulatory focus suggests that by shaping the regulatory focus of followers to match that of leaders, leaders may be able to create fit for followers (Johnson et al., 2017a). Although this work is primarily concerned with fit between leaders and followers, the results of Study 4 suggest that leaders have knowledge of how to create regulatory fit between followers and *tasks*. Since fit between motivational states and tasks leads to increase engagement, satisfaction, and performance (Higgins, 2005; Motyka et al., 2014), leaders and followers may reap additional benefits when leaders have knowledge of how to flexibly shift followers' motivation in response to changing situational and task demands.

Table 8

Accuracy indices for metamotivational knowledge in managing the motivation of others.

Study	Index	M (SD)	t	df	p	95% CI Lower	Upper
1	Task	1.73 (3.18)	7.05	167	$< .001$	1.25	2.22
2	Task	1.37 (2.48)	6.82	152	$< .001$	0.97	1.77
3 (Leaders)	Strategy	0.50 (1.10)	6.67	180	$< .001$	0.34	0.66
3 (Students)	Strategy	0.44 (1.07)	5.72	197	$< .001$	0.29	0.59
4 (LIWC)	Strategy	4.42 (4.59)	12.99	181	$< .001$	3.75	5.09
4 (Human Coded)	Strategy	1.96 (0.85)	31.06	181	$< .001$	1.84	2.08

Note: One sample *t*-tests indicate whether each accuracy index is significantly different from zero.

CHAPTER FOUR: GENERAL DISCUSSION

Across four studies, this research examined how leaders manage the motivation of others by examining whether leaders' have metamotivational knowledge of how to create task-motivation fit in followers using a regulatory focus framework. Study 1 and 2 provide evidence for accurate metamotivational task knowledge (Scholer, et al., 2018) by demonstrating that leaders are sensitive to qualitative differences in followers' motivational orientations and the impact this has on task performance. Specifically, participants accurately predicted that promotion-focused employees would fit better with eager tasks, and that prevention-focused employees would fit better with vigilant tasks.

Study 3 and 4 provided evidence for accurate metamotivational strategy knowledge (Scholer et al., 2019) for creating task-motivation fit by demonstrating that leaders have knowledge of how to induce motivational states in followers. Study 3 used a close-ended paradigm, asking participants how different motivational strategies would impact follower task success. Results revealed that participants accurately predicted followers would be more successful at eager tasks after leaders motivated them with promotion-focused strategies, and vigilant tasks after leaders used prevention-focused strategies. Study 4 extended these findings by investigating spontaneous generation of metamotivational strategy knowledge, asking leaders how they would motivate others using an open-ended and consequential paradigm. Analysis using both LIWC software (Pennebaker et al., 2015) and trained human coders revealed that leaders spontaneously generated promotion- and prevention-focused strategies to prepare others for eager and vigilant tasks, respectively. Taken together, these studies demonstrate that leaders have some accurate knowledge of how to actively and flexibly manage the eager and vigilant motivations of others to create task-motivation fit.

Contributions

By providing evidence for leaders' metamotivational knowledge in managing the motivation of others, the current studies advance prior work on leadership and motivation, and the social context of goal pursuit more broadly. First, prior leadership work tends to focus on single domains of managing follower motivation by emphasizing the quantity of motivation (e.g., Locke & Latham, 2002), the importance of specific types of motivation in followers (e.g., Gillet et al., 2010), and fit between leader and follower motivational orientations (e.g., Hamstra et al., 2014a). In contrast, the current studies demonstrate that leaders have knowledge for how to flexibly consider more than one approach to managing the motivation of followers. Laying this foundation can allow future research to fully explore the role of metamotivation in leadership in myriad ways, including investigations of how leaders' metamotivational knowledge affects followers and their performance and how knowledge is implemented in everyday leadership settings. For example, future research can investigate how leaders' use their metamotivational knowledge to effectively manage the motivation of groups instead of the single leader-follower dyads utilized in the present research. In these situations, leaders need to consider the motivational states of multiple others in the pursuit of single and/or multiple goals, thus requiring leaders to flexibly and accurately apply their metamotivational knowledge. Additionally, offering initial evidence for leaders' metamotivational knowledge in a regulatory focus framework allows future work to examine other types of motivational challenges faced by leaders, such as leaders' metamotivational knowledge of self-determination theory (Deci & Ryan, 2000) and how followers are differentially influenced by intrinsic versus extrinsic motivation.

Second, previous work on metamotivation has only focused on how people manage their own motivation (Edwards et al., 2019; Nguyen et al., 2019; Scholer & Miele, 2016),

demonstrating that people possess accurate metamotivational knowledge to create task-motivation fit for themselves. This research expands upon this past work by considering the role of metamotivation in managing the motivation of *others*. Prior work on the social context of goal pursuit, for example, conceptualizes dyads or teams as single self-regulatory units where individuals pursue their own goals, others' goals, and the goals of the whole unit (Fitzsimons, Finkel, & vanDellen, 2015; Fitzsimons, Sackett, & Finkel, 2016). In contrast, the current studies provide an interesting insight into the social context of goal pursuit by suggesting that leaders have knowledge of how to manage the motivation of others, and can thereby promote effective goal pursuit for others. While the present research focuses on leadership, which contains inherent power dynamics where leaders exert influence over followers, future research should consider the role of metamotivation in the social context of goal pursuit more broadly. For example, future research can examine the role of metamotivational knowledge in the pursuit of goals in contexts where individuals are presumably of more equal status and power, such as close relationships.

<div align="center">**Limitations and Future Directions**</div>

Leader Perceptions

While the present research offers interesting insights into how leaders manage the motivation of others, it is unknown how their accurate versus inaccurate knowledge impacts followers. Prior work demonstrates that when leaders and followers experience fit between their respective motivational orientations, followers view leaders more positively (Johnson et al., 2017b). Since individuals experience greater engagement and satisfaction when their means of goal pursuit are congruent with their underlying motivational orientations (Higgins, 2005), followers may also come to evaluate leaders more positively when they are able to create task-

motivation fit for followers. Effective leadership further results in greater performance and overall satisfaction (Harter, Schmidt, & Hayes, 2002; Hogan & Kaiser, 2005), and given the benefits of regulatory fit for both individuals and leader-follower relationships, leaders and followers may reap additional benefits when leaders are able to flexibly manage the motivation of followers to create task-motivation fit. Thus, the impact of leaders' metamotivational knowledge on leader perceptions is a fruitful area for future research. Additionally, this research can offer initial insights into the downstream consequences of accurate versus inaccurate metamotivational knowledge, an area that has not yet been explored (Scholer et al., 2018).

The Role of Experience

With the exception of Study 2, the various measures of leader experience used in these studies were largely unrelated to increased accuracy in knowledge of how to manage follower motivation. While the measures of experience used are proxies based on self-report and do not indicate experience in specific types of leadership roles or in particular industries (among other factors), past research has yielded mixed evidence for the role of experience in leader effectiveness. In a meta-analysis by Hoffman et al. (2011), past experience was only weakly associated with overall leader effectiveness. However, experience was a stronger predictor of leader effectiveness for low-level managers and in particular industries (e.g., government/military), but was weakly associated with objective leader effectiveness. Additionally, the accuracy indices used in the present research are not validated measures of leader performance. Caution is therefore warranted in interpreting the correlations between experience and accurate knowledge in the current studies.

Due to these limitations, future research should more fully consider the role of experience in leaders' metamotivational knowledge by using validated measures of leader experience across

a variety of domains and validated measures of leader effectiveness. Moreover, addressing the role of experience in leaders' metamotivational knowledge can provide insight into the variability in accuracy that was observed in the present research. For example, Study 3 and prior research on metamotivation and regulatory focus (Scholer & Miele, 2016) revealed a general bias towards favouring strategies that induce a promotion focus. It may be the case, for example, that leaders with less experience in managing others rely more on such heuristic biases, while those with more experience are more sensitive to the differential effects of qualitatively different motivational states on follower performance.

Variability in Metamotivational Knowledge

Replicating prior metamotivation work (Edwards et al., 2019; Nguyen et al., 2019; Scholer & Miele, 2016), participants in the present studies exhibited substantial variation in the accuracy of their metamotivational knowledge, raising interesting questions for how to both unpack and improve this accuracy. First, the wide variation in metamotivational knowledge suggests that an expanded search for moderators is warranted. In addition to further examining the role of experience and the individual difference measures included in the current studies, other moderators such as different types of leadership roles (e.g., floor manager versus CEO), different leadership contexts (e.g., workplace versus athletic coaching), and leaders' own motivational orientations should be considered. For example, prior work demonstrates that chronically promotion-focused leaders are more likely to engage in behaviours that communicate visions for advancement, while chronically prevention-focused leaders are more likely to engage in behaviours that communicate performance standards and vigilantly monitor performance (Johnson et al., 2017b). The current studies do not ascertain the role of these potential moderators in metamotivational knowledge, providing a fruitful line of inquiry for future

51

research. For instance, perhaps as the strength of leaders' chronic motivational orientation increases, the less accurate their metamotivational knowledge becomes due to the greater influence of chronic preferences on managing the motivation of others.

Moreover, determining the characteristics of leaders with accurate versus inaccurate metamotivational knowledge allows for the development of methods of to improve knowledge. For example, 360-degree feedback is often used to identify areas of improvement for leaders in organizations. In this process, leaders (and employees more broadly) obtain feedback on their performance from subordinates, colleagues, superiors, and self-ratings to guide development and improve performance (Craig & Hannum, 2006; Kluger & DeNisi, 1996; Nowack & Mashihi, 2012). Future research can adapt such methods to identify areas of accuracy versus inaccuracy in leaders' metamotivational knowledge, thereby allowing them to become more effective in how they manage the motivation of their followers.

Implementing Metamotivational Knowledge

Thus far, these studies only offer evidence that leaders have some accurate metamotivational *knowledge* of how to manage the motivation of followers, and do not allow for any conclusions to be drawn about how this knowledge is used in naturalistic settings. Study 4 begins to offer insights into how leaders implement metamotivational knowledge through spontaneous generation in an open-ended and consequential paradigm, but is still prone to the limitations of laboratory studies. Future research should therefore obtain data on leaders' metamotivational knowledge and its implementation in actual leadership settings, such as within organizations. In such contexts, the accuracy versus inaccuracy of leaders' metamotivational knowledge poses real consequences for followers, their performance, and the performance of the

organization as a whole. Moreover, this research allows for realistic estimations of flexibility in managing the motivation of others, a critical component of metamotivation (Scholer et al., 2018).

Furthermore, the present research is unable to address the dynamic nature of leader-follower relationships (e.g., Johnson et al., 2017b) and how this may influence the management of follower motivation. Indeed, poor quality leader-follower relationships cue followers to impair their performance in reciprocation (Quade, McLarty, & Bonner, 2019), while high quality relationships allow followers to flourish (Wang, Sui, Luthans, Wang, & Wu, 2014). Thus, despite the accuracy versus inaccuracy of leaders' metamotivational knowledge, its implementation and effect on followers can be hindered or helped by leaders' relationship with followers. To address these concerns, future research should explore how the implementation of leaders' metamotivational knowledge is influenced by the quality of leader-follower relationships. For example, students' relationships with teachers may influence how effectively teachers can flexibly encourage students to both reach new heights on their science projects and scrutinize the grammatical details of their essays, making educational contexts a promising area for future research to investigate how leaders' metamotivational knowledge is implemented.

Conclusion

In summary, this research integrates prior work in leadership, motivation, and metamotivation, and is the first to explore the role of metamotivation in managing the motivation of others. Across four studies, results demonstrate that leaders possess both accurate metamotivational task and strategy knowledge in managing followers, suggesting that the management of follower motivation may be a more active process than previous research has shown. Moreover, these results demonstrate that leaders have knowledge of how to flexibly manage the motivation of others in more than one domain. Future research will extend this work

by examining how leaders' metamotivational knowledge impacts followers, thereby beginning to explore the downstream consequences of accurate versus inaccurate metamotivational knowledge. By examining the role of metamotivation in leadership, this research offers new insights into how leaders can be more effective in managing others and address the variety of motivational challenges they face. Finally, advancing metamotivation beyond the context of the self provides novel insights for the social context of goal pursuit.

References

Bai, H. (2018, August 8). Evidence that a large amount of low quality responses on MTurk can be detected with repeated GPS coordinates [Blog post]. Retrieved from https://www.maxhuibai.com/blog/evidence-that-responses-from-repeating-gps-are-random

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, USA: Free Press.

Berson, Y., Halevy, N., Shamir, B., & Erez, M. (2015). Leading from different psychological distances: A construal-level perspective on vision communication, goal setting, and follower motivation. *The Leadership Quarterly*, *26*, 143–155. https://dx.doi.org/10.1016/j.leaqua.2014.07.011

Craig, S. B., & Hannum, K. (2006). Research update: 360-Degree performance assessment. *Consulting Psychology Journal: Practice and Research*, *58*, 117–124. https://dx.doi.org/10.1037/1065-9293.58.2.117

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 61-149). San Diego, USA: Elsevier Academic Press. http://dx.doi.org/10.1016/S0065-2601(07)00002-0

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 in social psychology* (pp. 416–437). London, UK: Sage.

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

Edwards, J., Hubley, C., Scholer, A. A., Miele, D. B. (2018). *Metamotivation about intrinsic-extrinsic trade-offs*. Manuscript in preparation.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175–191. https://dx.doi.org/10.3758/BF03193146

Fishbach, A., & Tu, Y. (2016). Pursuing goals with others. *Social and Personality Psychology Compass*, *10*, 298–312. https://dx.doi.org/10.1111/spc3.12251

Fitzsimons, G. M., Finkel, E. J., & vanDellen, M. R. (2015). Transactive goal dynamics. *Psychological Review*, *122*, 648–673. https://dx.doi.org/10.1037/a0039654

Fitzsimons, G. M., Sackett, E., & Finkel, E. J. (2016). Transactive Goal Dynamics Theory: A relational goals perspective on work teams and leadership. *Research in Organizational Behavior*, *36*, 135–155. https://dx.doi.org/10.1016/j.riob.2016.11.006

Forster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: Regulatory focus and the 'goal looms larger' effect. *Journal of Personality and Social Psychology*, *75*, 1115–1131. http://dx.doi.org/10.1037/0022-3514.75.5.1115

Freitas, A. L., & Higgins, E. T. (2002). Enjoying goal-directed action: The role of regulatory fit. *Psychological Science*, *13*, 1–6. https://dx.doi.org/10.1111/1467-9280.00401

Gallup (2017). *State of the Global Workplace*. Retrieved from https://www.gallup.com/workplace/238079/state-global-workplace-2017.aspx?utm_source=2013StateofGlobalWorkplaceReport&utm_medium=2013SOG

WReportLandingPage&utm_campaign=2013StateofGlobalReport_Redirectto2017page&
utm_content=download2017now_textlink

Gamache, D. L., McNamara, G., & Johnson, R. E. (2015). CEO regulatory focus: The impact on firm acquisitions. *Academy of Management Journal*, *4*, 1261–1282. http://dx.doi.org/10.5465/amj.2013.0377

Gillet, N., Vallerand, R. J., Amoura, S., & Baldes, B. (2010). Influence of coaches' autonomy support on athletes' motivation and sport performance: A test of the hierarchical model of intrinsic and extrinsic motivation. *Psychology of Sport and Exercise*, *11*, 155–161. https://dx.doi.org/10.1016/j.psychsport.2009.10.004

Hamstra, M. R. W., Sassenberg, K., Van Yperen, N. W., & Wisse, B. (2014)a. Followers feel valued: When leaders' regulatory focus makes leaders exhibit behavior that fits followers' regulatory focus. *Journal of Experimental Social Psychology*, *51*, 34–40. https://dx.doi.org/10.1016/j.jesp.2013.11.003

Hamstra, M. R. W., Van Yperen, N. W., Wisse, B., & Sassenberg, K. (2014)b. On the perceived effectiveness of transformational-transactional leadership: The role of encouraged strategies and followers' regulatory focus: Leadership, strategies, and regulatory focus. *European Journal of Social Psychology*, *44*, 643–656. https://dx.doi.org/10.1002/ejsp.2027

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *Journal of Applied Psychology*, *87*, 268–279. https://dx.doi.org/10.1037/0021-9010.87.2.268

Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, *52*, 1280–1300.

> https://dx.doi.org/10.1037/0003-066X.52.12.1280

Higgins, E. T. (2005). Value from regulatory fit. *Current Directions in Psychological Science*,

> *14*, 209–213. https://dx.doi.org/10.1111/j.0963-7214.2005.00366.x

Higgins, E. T., & Cornwell, J. F. M. (2016). Securing foundations and advancing frontiers:

> Prevention and promotion effects on judgment & decision making. *Organizational*
>
> *Behavior and Human Decision Processes*, *136*, 56–67.
>
> https://dx.doi.org/10.1016/j.obhdp.2016.04.005

Hoffman, B. J., Woehr, D. J., Maldagen-Youngjohn, R., & Lyons, B. D. (2011). Great man or

> great myth? A quantitative review of the relationship between individual differences and
>
> leader effectiveness: Leader traits, meta-analysis. *Journal of Occupational and*
>
> *Organizational Psychology*, *84*, 347–381. https://dx.doi.org/10.1348/096317909X485207

Hogan, R., & Kaiser, R. B. (2005). What we know about leadership. *Review of General*

> *Psychology*, *9*, 169–180. https://dx.doi.org/10.1037/1089-2680.9.2.169

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and

> theoretical perspectives. In L.A. Pervin & O. P. Johns (Eds.), *Handbook of personality:*
>
> *Theory and research* (pp. 102–138). New York, USA: Guildford Press.

Johnson, R. E., King, D. D., Joanna Lin, S. H., Scott, B. A., Jackson Walker, E. M., & Wang, M.

> (2017)a. Regulatory focus trickle-down: How leader regulatory focus and behavior shape
>
> follower regulatory focus. *Organizational Behavior and Human Decision Processes*, *140*,
>
> 29–45. https://dx.doi.org/10.1016/j.obhdp.2017.03.002

Johnson, R. E., Lin, S. H. J., Kark, R., Van Dijk, D., King, D. D., & Esformes, E. (2017)b.

> Consequences of regulatory fit for leader–follower relationship quality and commitment.

Journal of Occupational and Organizational Psychology, *90*, 379–406.

https://dx.doi.org/10.1111/joop.12176

Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A

qualitative and quantitative review. *Journal of Applied Psychology*, *87*, 765–780.

https://dx.doi.org/10.1037//0021-9010.87.4.765

Kark, R., & Van Dijk, D. (2007). Motivation to lead, motivation to follow: The role of the self-

regulatory focus in leadership processes. *Academy of Management Review*, *32*, 500–528.

http://dx.doi.org/10.2307/20159313

Kleingeld, A., van Mierlo, H., & Arends, L. (2011). The effect of goal setting on group

performance: A meta-analysis. *Journal of Applied Psychology*, *96*, 1289–1304.

https://dx.doi.org/10.1037/a0024315

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A

historical review, a meta-analysis, and a preliminary feedback intervention theory.

Psychological Bulletin, *119*, 254–284. https://dx.doi.org/10.1037/0033-2909.119.2.254

Lakens, D. (2014, June 7). Calculating confidence intervals for Cohen's d and eta-squared using

SPSS, R, and Stata [Blog post]. Retrieved from https://

http://daniellakens.blogspot.com/2014/06/calculating-confidence-intervals-for.html

Leyland, A., Rowse, G., & Emerson, L.-M. (2019). Experimental effects of mindfulness

inductions on self-regulation: Systematic review and meta-analysis. *Emotion*, *19*, 108–

122. https://dx.doi.org/10.1037/emo0000425

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and

task motivation: A 35-year odyssey. *American Psychologist*, *57*, 705–717.

https://dx.doi.org/10.1037//0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science*, *15*, 265–268.

Mageau, G. A., & Vallerand, R. J. (2003). The coach–athlete relationship: A motivational model. *Journal of Sports Sciences*, *21*, 883–904. https://dx.doi.org/10.1080/0264041031000140374

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

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*, 394–410. https://dx.doi.org/10.1016/j.jcps.2013.11.004

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. https://dx.doi.org/10.1037/pspa0000166

Nowack, K. M., & Mashihi, S. (2012). Evidence-based answers to 15 questions about leveraging 360-degree feedback. *Consulting Psychology Journal: Practice and Research*, *64*, 157–182. https://dx.doi.org/10.1037/a0030011

Patall, E. A., Cooper, H., & Robinson, J. C. (2008). The effects of choice on intrinsic motivation and related outcomes: A meta-analysis of research findings. *Psychological Bulletin*, *134*, 270–300. https://dx.doi.org/10.1037/0033-2909.134.2.270

Pennebaker, J.W., Boyd, R.L., Jordan, K., & Blackburn, K. (2015). *The development and psychometric properties of LIWC2015*. Austin, USA: University of Texas at Austin.

Pintrich, P. R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory Into Practice*, *41*, 219–225. https://dx.doi.org/10.1207/s15430421tip4104_3

Quade, M. J., McLarty, B. D., & Bonner, J. M. (n.d.). The influence of supervisor bottom-line mentality and employee bottom-line mentality on leader-member exchange and subsequent employee performance. *Human Relations*. Advance online publication. https://dx.doi.org/10.1177/0018726719858394

Reber, A. S. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General*, *118*, 219–235. http://dx.dx.doi.org/10 .1037/0096-3445.118.3.219

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

Sassenberg, K., & Hamstra, M. R. W. (2017). The intrapersonal and interpersonal dynamics of self-regulation in the leadership process. In *Advances in Experimental Social Psychology* (Vol. 55, pp. 193–257). Academic Press. https://dx.doi.org/10.1016/bs.aesp.2016.08.001

Scholer, A. A., Cornwell, J. F. M., & Higgins, E. T. (2019). Regulatory focus theory and research: Catching up and looking forward after 20 years. In R. M. Ryan (Ed.), *The Oxford Handbook of Human Motivation* (pp. 47–66). Oxford, UK: Oxford University Press.

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). Oxford, UK: Oxford University Press. https://dx.dx.doi.org/10.1093/oxfordhb/9780195399820.013.0005

Scholer, A. A., & Miele, D. B. (2016). The role of metamotivation in creating task-motivation fit. *Motivation Science*, *2*(3), 171–197. https://dx.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*, 437–442. http://dx.doi.org/10.1177/0963721418790549

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://dx.doi.org/10.1016/j.lindif.2016.12.003

Snyder, M. (1974). Self-monitoring of expressive behavior. *Journal of Personality and Social Psychology*, *30*, 526–537. https://dx.doi.org/10.1037/h0037039

Steiger, J. H. (2004). Beyond the F Test: Effect size confidence intervals and tests of close fit in the analysis of variance and aontrast analysis. *Psychological Methods*, *9*, 164–182. https://dx.doi.org/10.1037/1082-989X.9.2.164

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, *117*, 440–463. https://dx.doi.org/10.1037/a0018963

TurkPrime. (2018, September 18). *After the bot scare: Understanding what'sbeenhappeningwithdatacollectiononMTurkandhowtostop it [Blog post]*. Retrieved from https://blog.turkprime.com/after-the-bot-scare-understanding-whats-been-happening-with-data-collection-on-mturk-and-how-to-stop-it

van Genugten, L., Dusseldorp, E., Massey, E. K., & van Empelen, P. (2017). Effective self-regulation change techniques to promote mental wellbeing among adolescents: A meta-analysis. *Health Psychology Review*, *11*, 53–71. https://dx.doi.org/10.1080/17437199.2016.1252934

Van Katwyk, P. T., Fox, S., Spector, P. E., & Kelloway, E. K. (2000). Using the Job-Related

    Affective Well-Being Scale (JAWS) to investigate affective responses to work stressors.

    Journal of Occupational Health Psychology, *5*, 219–230.

    https://dx.doi.org/10.1037//1076-8998.5.2.219

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*, 436–458.

    http://dx.doi.org/10.1037/0022-3514 .49.2.436

Wang, H., Sui, Y., Luthans, F., Wang, D., & Wu, Y. (2014). Impact of authentic leadership on

    performance: Role of followers' positive psychological capital and relational processes.

    Journal of Organizational Behavior, *35*, 5–21. https://dx.doi.org/10.1002/job.1850

Wolters, C. A. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-

    regulated learning. *Educational Psychologist*, *38*, 189–205.

    https://dx.doi.org/10.1207/S15326985EP3804_1

Wolters, C. A. (1998). Self-regulated learning and college students' regulation of motivation.

    Journal of Educational Psychology, *90*, 224–235. http://dx.doi.org/10.1037/0022-

    0663.90.2.224

Wong, C. S., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on

    performance and attitude: An exploratory study. *The Leadership Quarterly*, *13*, 243–274.

    https://dx.doi.org/10.1016/S1048-9843(02)00099-1

Appendix A

Materials used in the self-knowledge assessment across all studies.

<u>Tasks</u>

Eager	Description	Vigilant	Description
Brainstorming	Your goal is to be as creative as possible be seizing opportunities to take the ordinary and innovate.	Proofreading	Your goal is to be as accurate as possible by making sure to avoid lurking errors and pitfalls.
Creative Writing	Your goal is to imagine a future no one has seen before by seeing possibilities and occasions for advancement.	Problem Solving	Your goal is to be precise and make sure you don't take a wrong turn in figuring out the write next step.

<u>Recall Activities</u>

How successful do you expect to be at [the task] after writing about:

Promotion	Prevention
• a time you felt you made progress to being successful in life?	• a time when you were careful not get on your parents' nerves?
• a time when, compared to most people, you were able to get what you wanted out life?	• your duties and obligations as a child
• your hopes and aspirations as a child	• a time when being careful avoided getting you into trouble?
• a time you achieved something important to you?*	• a time you stopped yourself from acting in a way your parents would have considered objectionable?
• a time you really excelled at something important to you?	

* Only used in Study 1.

Materials used in the employee assignment task in Study 1.

In this part of the study, we are going to describe two employees you would typically find in an office environment. Once you have read their descriptions, we are going to ask you to assign tasks to them and predict how well you think they will do on those tasks.

<u>Promotion-Focused Employee</u>
[Ellen / Evan] prefers tasks that are typically performed in an eager and enthusiastic manner. [She / he] does these tasks in order to attain advancement, growth, and accomplishments. [Her / his] goal is to one day lead the company, or start [her / his] own company.

<u>Prevention-Focused Employee</u>
[Victoria / Victor] prefers tasks that are performed in a careful and vigilant manner. [She / he] does these tasks in order to attain security, safety, and to fulfill responsibilities. [Her / his] goal is to maintain a sense of job security so [she / he] can provide for her family.

<u>Instructions</u>
Imagine you are a project manager for a large real-estate developer. A client approaches your firm requesting a design for a new home. As the project manager, you need to assign different aspects of the project to [Ellen / Evan] and [Victoria / Victor].

Eager Task
Planning and Design Task
The client wishes the house to "stand out" - they are not interested in a conventional home, but praise innovation and modern design. This house should represent what the ideal modern home will look like and set new industry standards.

Vigilant Task
Construction and Presentation Task
A model home needs to be constructed that adheres to the criteria requested by the client. This model then needs to be presented to the client. The presentation needs to include all the aspects of the design requested by the client to prove that your firm met expectations.

Dependent Measure
I believe that [employee name] would be…for the [task name].
- suitable for
- engaged in
- likely to enjoy
- successful at
- motivated for

Rated on a scale from 1 (*not at all*) to 7 (*extremely*).

Appendix C

Employee profiles used in the pilot study for Study 2.

Participant Instructions
In today's study, we are going to ask you to evaluate two employees you might find in a typical workplace. You will be given brief descriptions of each employee, and then be asked to answer a few questions about what you think of them.

Promotion-Focused Employee
[Ellen / Evan] has accomplished a lot in [her / his] time with the company, and can always be relied upon to spot new opportunities for company growth. [Her / his] employee reviews praise [her / his] progress, but mention that [she / he] occasionally misses small details. [She / he] would like to one day lead the company to fulfill [her / his] dream of running a business.

Prevention-Focused Employee
[Victoria / Victor] has high standards that are in line with company values, and can always be relied upon to uphold company policy. [Her / his] employee reviews praise [her / his] responsibility and diligence, but mention that [she / he] sometimes lacks initiative in starting new projects. [She / he] would like to one day lead the company so [she / he] can ensure financial stability for the company.

Dimension Ratings
I think [employee name] is…
1. Warm
2. Friendly
3. Nice
4. Sincere
5. Competent
6. Able
7. Skillful
8. Confident
9. Trustworthy
10. Ambitious

Appendix D

Methods and results of the pilot study used to match employee profiles on perceived warmth and competence in Study 2.

Participants

100 participants were recruited through Amazon's Mechanical Turk and received US$1.00 as remuneration. The final sample was composed of 98 participants (42% female, 58% male, Mdn_{age} = 33.50, SD = 10.12)[7]. Given this sample size, and assuming a correlation between repeated measures of .50 and a non-sphericity correction of 1, the minimum effect size that can be detected with 80% power at p = .05 is η_p^2 = .01 (Faul et al., 2007).

Materials and Procedure

Participants were randomly assigned to view either male or female employee descriptions.[8] Within each of the two conditions and in random order, participants evaluated one promotion-focused and one prevention-focused employee, and rated each of them on their perceived warmth (α = .88 and .89 for prevention and promotion employees, respectively) and competence (α = .83 and .86 for prevention and promotion employees, respectively; Cuddy et al., 2008), and on single-item measures of perceived trust and ambition on a scale from 1 (*not at all*) to 7 (*extremely;* see Appendix C).

---

[7] Data from two participants were excluded as their data came from potential bots. These were identified through duplicate GPS coordinates.

[8] When employee gender was entered as a between-participants factor, there were no significant interactions with employee type, $F(1, 96)$ = 2.13, p = .148, η_p^2 = .02, or dimension, $F(2.30, 220.48)$ = 0.83, p = .454, η_p^2 = .01. The three-way interaction between employee type, dimension, and employee gender was also not significant, $F(2.18, 208.95)$ = 0.14, p = .883, η_p^2 < .01. Thus, employee-gender collapsed are reported.

Results

A two (employee: promotion versus prevention) by four (dimension: warmth, competence, trust, ambition) repeated measures ANOVA revealed a significant main effect of employee type, $F(1, 97) = 13.51$, $p < .001$, $\eta_p^2 = .12$, 90% CI [0.04, 0.23]. Post-hoc LSD tests showed that participants gave higher overall ratings to the promotion-focused employee ($M = 5.66$, $SD = 0.83$) than the prevention-focused employee ($M = 5.41$, $SD = 0.83$), $t(97) = 3.68$, $p < .001$, 95% CI = [0.12, 0.39], $d = 0.37$. There was also a significant main effect of dimension, $F(2.30, 223.31) = 3.32$, $p = .032$, $\eta_p^2 = .03$, 90% CI [0.00, 0.07]. Bonferroni multiple comparisons showed that participants gave marginally higher overall ratings on perceived trust ($M = 5.59$, $SD = 0.97$) than warmth ($M = 5.38$, $SD = 0.81$) overall, $p = .052$, 95% CI = [-.01, .42]. No other comparisons were significant.

These main effects were qualified by a significant employee by dimension interaction, $F(2.18, 211.19) = 17.65$, $p < .001$, $\eta_p^2 = .15$, 90% CI [0.08, 0.22]. Post-hoc LSD tests revealed that participants perceived the promotion-focused employee ($M = 5.45$, $SD = 0.89$) as marginally higher in warmth than the prevention-focused employee ($M = 5.30$, $SD = 0.92$), $t(97) = 1.84$, $p = .069$, 95% CI = [-0.01, 0.31], $d = 0.19$. Participants also perceived the promotion-focused employee ($M = 6.08$, $SD = 1.16$) as significantly higher in ambition that the prevention-focused employee ($M = 5.20$, $SD = 1.53$), $t(97) = 5.52$, $p < .001$, 95% CI = [0.56, 1.19], $d = 0.56$. No other comparisons were significant (see Table 9).

Table 9

Descriptive statistics and LSD comparisons for participant ratings of employee profiles (Pilot Study).

	Promotion Employee M (SD)	Prevention Employee M (SD)	t	p	95% CI
Warmth	5.45 (0.89)	5.30 (0.92)	1.84	.069	-0.01, 0.31
Competence	5.54 (0.89)	5.49 (0.92)	0.57	.572	-0.12, 0.22
Trust	5.55 (1.13)	5.62 (1.06)	-0.70	.489	-0.28, 0.13
Ambition	6.08 (1.16)	5.20 (1.53)	5.52	< .001	0.56, 1.19

Note: $N = 98$

Materials used in the employee assignment task in Study 2.

In this part of the study, we are going to describe leadership scenarios. After each description, you will be presented with the profile of a typical employee. Once you have read their profile, we are going to ask you to assign tasks to them and predict how well you think they will do on those tasks.

Promotion-Focused Employee
[Ellen / Evan] has accomplished a lot in her time with the company, and can always be relied upon to spot new opportunities for company growth. [Her / his] employee reviews praise [her / his] progress, but mention that [she / he] occasionally misses small details. [She / he] would like to one day lead the company to fulfill [her / his] dream of running a business.

Prevention-Focused Employee
[Victoria / Victor] has high standards that are in line with company values, and can always be relied upon to uphold company policy. [Her / his] employee reviews praise [her / his] responsibility and diligence, but mention that [she / he] sometimes lacks initiative in starting new projects. [She / he] would like to one day lead the company so [she / he] can ensure financial stability for the company.

Instructions
Imagine you are a project manager for an advertising agency. A client approaches your firm and requests an advertising campaign. As the project manager, your goal is to assign different aspects of the project to your subordinates.

Eager Task
Campaign Development
Your task is to assign an employee to develop an innovative advertising campaign. This employee will draft various alternatives, and present each of them to the client in order to get the client to buy in to one of them.

Vigilant Task
Campaign Editing
Your task is to assign an employee to edit and review potential advertisements. This employee will review potential ads and make sure they keep up to date with advertising regulations and are error-free.

Dependent Measure
I believe that [employee name] would be…for the [task name].
- suitable for
- engaged in
- likely to enjoy
- successful at
- motivated for

Appendix F

Materials used in the strategy knowledge assessment in Study 3.

In this part of the study, we are going to describe various leadership tasks. After each task, we will ask you how you would prepare employees for the task, and how well you think they would do on the tasks.

Tasks

Eager	Description	Vigilant	Description
Product Development	Your task is to prepare an employee to develop a new product. The product needs to be innovative and set new industry standards.	Financial Management	Your task is to prepare an employee to manage the company's finances. They need to be precise and honest so the company does not get in trouble.
Client Recruitment	Your task is to prepare an employee to recruit new clients. They need to be enthusiastic and highlight the cutting-edge technology the company uses.	Quality Control	Your task is to prepare an employee for quality control of a new product. They need to monitor the product for any flaws, and ensure that the product meets consumer expectations.

Strategies

How successful do you expect an employee to be at [task name] after:

Promotion	Prevention
• emphasizing how much the company can grow? • getting them to realize their potential for achievement? • after praising their accomplishments and progress within the company? • after reminding them of the company's vision for the future?	• telling them to review employee performance standards? • reminding them to be careful and avoid mistakes? • telling them to follow company rules and regulations? • reminding them to act in a way the company would consider appropriate

Appendix G

Materials used in the strategy knowledge assessment in Study 4.

<u>Instructions</u>
In this part of the study, we are interested in how you prepare followers for tasks. Specifically, we are going to describe various tasks that another participant in a future study will complete. You will be asked to prepare the other participant for each task. Your responses will be used to help the other participant complete the tasks.

<u>Tasks</u>

Eager	Description	Vigilant	Description
Product Development	Your task is to prepare the other participant to develop a new product. The product needs to be innovative and set new industry standards.	Financial Management	Your task is to prepare the other participant to manage the company's finances. They need to be precise and honest so the company does not get in trouble.
Advertising	Your task is to prepare the other participant to develop a new advertising campaign. They need to draft various alternatives and persuade clients to buy into one of them.	Quality Control	Your task is to prepare the other participant for quality control of a new product. They need to monitor the product for any flaws, and ensure that the product meets consumer expectations.

<u>Prompt</u>
What would say to the other participant to motivate them for [task name]?

Appendix H

LIWC dictionary used to score open-ended responses in Study 4. Asterisks indicate word stems.

Promotion	Prevention
accomplish*	accur*
achiev*	afraid
add*	alarm*
advanc*	alert*
adventure*	analy*
ambitio*	anxi*
approach*	apprehen*
aspir*	atten*
attain*	avert*
best	avoid*
better	care*
beyond	cautio*
bonus	conserv*
creativ*	concern*
desire*	concrete*
dream*	correct*
driv*	defend*
eager*	detail*
earn*	diligen*
energ*	discipline*
enhanc*	dodg*
enthusias*	dut*
envision	error*
excit*	escap*
expand*	evad*
explor*	exact
faith	fail*
fast*	fault*
fun	fear*
gain*	guard*
grow*	guilt*
high*	job
hit*	los*
hop*	maintain*
ideal*	methodical
improv*	meticulous*
incentive*	miss*
increas*	mistake*
ingenious	must
inspir*	need
joy*	neglect*

momentum	nerv*
novel	obligat*
obtain*	ought*
original	pain*
optimis*	particular*
passion*	perfect*
perfect*	precis*
pride*	preserve*
prize*	prevent*
progress*	protect*
promot*	pruden*
proud	punctual
pump*	responsib*
reach*	right
reward*	risk*
speed*	safe*
striv*	satisf*
success*	secur*
succeed*	scare*
swift	should
toward*	strateg*
triumph*	systematic*
ultimate*	threat*
velocity	thorough
victor*	tru*
vision*	uphold*
want*	vigilan*
win*	warn*
wish*	wary
zeal*	watch*
	worr*

Appendix I

Coding scheme used to code open-ended responses on promotion and prevention in Study 4.

Regulatory Focus	Dimension	Description	Code
Promotion	Abstract	Does the participant use language that is inclusive, broad, or general? That is, do they go beyond the task and focus on the big picture?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Promotion	Speed	Does the participant prioritize quantity, doing the task quickly, and/or doing as much as possible?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Promotion	Gains	How much does the participant emphasize gains, benefits, or achievements?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Promotion	Ideals	How much does the participant emphasize hopes, aspirations, visions, and/or the best possible result?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Prevention	Concrete	Does the participant use language that is specific, narrow, or concrete? That is, do they focus on the details of the task?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Prevention	Accuracy	Does the participant prioritize quality and doing the task precisely, correctly, and/or accurately?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)
Prevention	Losses	How much does the participant emphasize the losses, failures, or mistakes?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)

Prevention	Oughts	How much does the participant emphasize duties, responsibilities, and/or what should or needs to be done?	1 (not at all) 2 (a little) 3 (moderately) 4 (very much) 5 (a great deal)

Appendix J

Table 10. *Pearson correlations between metamotivational accuracy and individual difference variables in Study 4.*

	1	2	3	4	5	6	7
1. Overall Self Accuracy	–						
2. LIWC Overall Accuracy	.10	–					
3. Human Coded Overall Accuracy	.12	.24**	–				
4. Conscientiousness	.08	.06	.02	–			
5. Openness to Experience	.05	-.03	.06	.39***	–		
6. Extraversion	-.04	.08	.02	.25***	.35***	–	
7. Emotional Intelligence	-.05	.04	.03	.47***	.43***	.31***	–
8. Self-Monitoring	.11	.08	.09	-.14†	.07	.30***	-.01

Note: $N = 182$

$†p < .10$, $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

Results of metamotivational self-knowledge assessment for all studies.

Study 1

A two (task type: eager versus vigilant) by two (recall activity: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task type, $F(1, 167)$ = 82.84, $p < .001$, $\eta_p^2 = .33$, 90% CI [0.24, 0.41], such that participants expected to perform better at vigilant tasks ($M = 5.44$, $SD = 1.27$) than eager tasks ($M = 4.89$, $SD = 1.29$), $t(167)$ = 9.10, $p < .001$, 95% CI = [0.44, 0.68], $d = 0.70$. There was also a significant main effect of recall activity, $F(1, 167) = 53.53$, $p < .001$, $\eta_p^2 = .24$, 90% CI [0.15, 0.33], such that participants expected to perform better after hypothetically engaging in promotion-focused recall activities ($M = 5.44$, $SD = 1.22$) than prevention-focused recall activities ($M = 4.90$, $SD = 1.39$), $t(167)$ = 7.32, $p < .001$, 95% CI = [0.40, 0.69], $d = 0.56$. These main effects are similar to those found in Scholer and Miele (2016), where participants also expected to perform better on vigilant tasks and after promotion-focused recall activities.

As predicted, and replicating Scholer and Miele (2016), these main effects were qualified by a significant task by recall interaction, $F(1, 167) = 8.87$, $p = .003$, $\eta_p^2 = .05$, 90% CI [0.01, 0.11] (see Figure 16). Participants expected to perform better after hypothetically engaging in prevention-focused recall activities before vigilant tasks ($M = 5.26$, $SD = 1.41$) than eager tasks ($M = 4.53$, $SD = 1.57$), $t(167) = 8.48$, $p < .001$, 95% CI = [0.55, 0.89], $d = 0.65$. However, in contrast to Scholer and Miele (2016), participants expected to perform better after hypothetically engaging in promotion-focused recall activities before vigilant tasks ($M = 5.64$, $SD = 1.36$) than eager tasks ($M = 5.25$, $SD = 1.28$), $t(167) = 4.85$, $p < .001$, 95% CI = [0.23, 0.55], $d = 0.37$. Consistent with this past work, however, participants expected to perform better on eager tasks

after hypothetically engaging in promotion-focused ($M = 5.24$, $SD = 1.28$) versus prevention-focused ($M = 4.53$, $SD = 1.57$) recall activities, $t(167) = 7.26$, $p < .001$, 95% CI = [0.52, 0.90], $d = 0.56$. Finally, participants also expected to perform better on vigilant tasks after hypothetically engaging in promotion-focused ($M = 5.64$, $SD = 1.36$) versus prevention-focused recalled activities ($M = 5.26$, $SD = 1.41$), $t(167) = 4.30$, $p < .001$, 95% CI [0.20, 0.55], $d = 0.33$.

To determine the accuracy of participants' self-relevant metamotivational knowledge, an overall performance prediction index was calculated (i.e., [Promotion Recall Performance Prediction for Eager Tasks – Prevention Recall Performance Prediction for Eager Tasks] + [Prevention Recall Performance Prediction for Vigilant Tasks – Promotion Recall Performance Prediction for Vigilant Tasks]). Higher numbers on this index indicate more accurate self-relevant metamotivational knowledge because participants are predicting better performance on eager tasks after promotion-focused recall activities and better performance on vigilant tasks after prevention-focused recall activities. Calculating this index revealed that, overall, participants demonstrated accurate self-relevant metamotivational knowledge in their performance estimates (see Table 11). However, as illustrated in Figure 11, there was significant variability in the accuracy of participants' metamotivational knowledge.
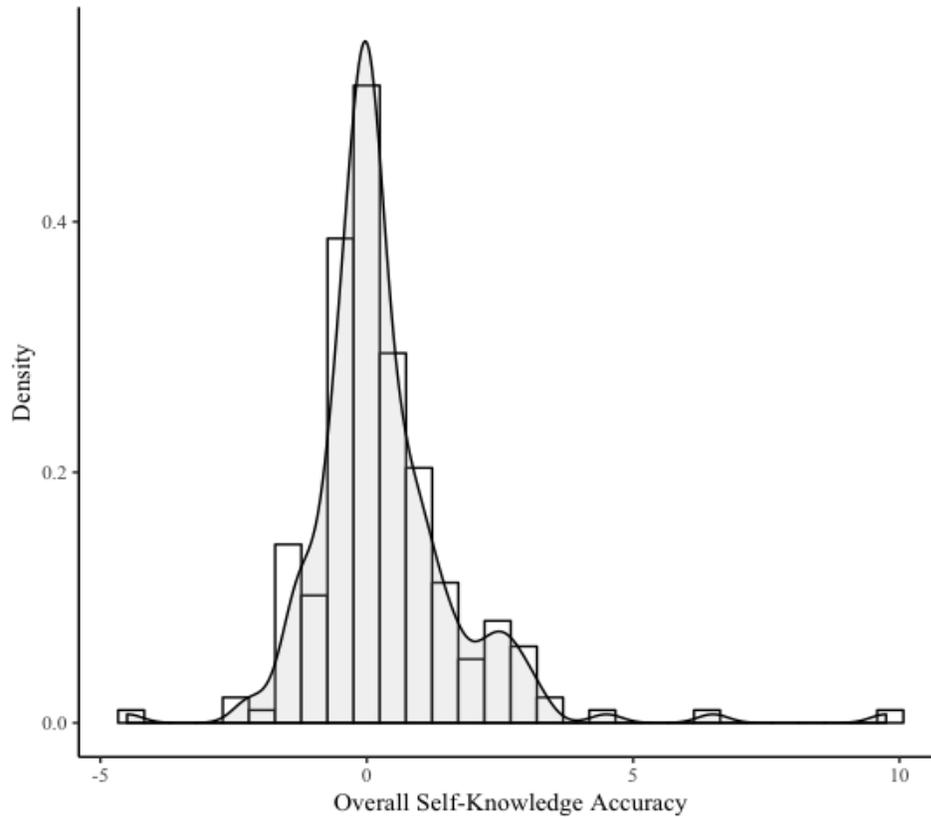
Figure 11. Density plot of overall self-knowledge accuracy in Study 1.

Study 2

A two (task type: eager versus vigilant) by two (recall activity: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task type, $F(1, 152)$ = 7.66, p = .006, η_p^2 = .05, 90% CI [0.01, 0.11]. Replicating Study 1, participants expected to perform better at vigilant tasks (M = 5.18, SD = 1.01) than eager tasks overall (M = 5.04, SD = 1.11), $t(152)$ = 2.77, p = .006, 95% CI = [0.04, 0.23], d = 0.22. There was also a significant main effect of recall activity, $F(1, 152)$ = 43.08, $p < .001$, η_p^2 = .22, 90% CI [0.13, 0.31], such that participants expected to perform better after hypothetically engaging in promotion-focused recall activities (M = 5.36, SD = 1.00) than prevention-focused recall activities overall (M = 4.85, SD = 1.24), $t(152)$ = 6.56, $p < .001$, 95% CI = [0.36, 0.66], d = 0.53.

These main effects were qualified by the predicted task by recall interaction, $F(1, 152) =$ 11.51, $p = .001$, $\eta_p^2 = .07$, 90% CI [0.02, 0.14], also replicating Study 1 (see Figure 16). Participants expected to perform better after hypothetically engaging in prevention-focused recall activities before vigilant tasks ($M = 4.98$, $SD = 1.22$) than eager tasks ($M = 4.73$, $SD = 1.40$), $t(152) = 3.70$, $p < .001$, 95% CI = [0.12, 0.40], $d = 0.30$. There was no difference in participants' performance expectancies after hypothetically engaging in promotion-focused recall activities before eager tasks ($M = 5.36$, $SD = 1.08$) than vigilant tasks ($M = 5.37$, $SD = 1.01$), $t(152) = -$ 0.20, $p = .845$, 95% CI = [-0.11, 0.09], $d = 0.02$. At the task level, participants expected to perform better at eager tasks after hypothetically engaging in promotion-focused ($M = 5.36$, $SD = 1.08$) compared to prevention-focused ($M = 4.73$, $SD = 1.40$) recall activities, $t(152) = 6.73$, $p < .001$, 95% CI [0.45, 0.82], $d = 0.54$. Finally, participants expected to perform better at vigilant tasks after hypothetically engaging in promotion-focused ($M = 5.37$, $SD = 1.01$) compared to prevention-focused ($M = 4.98$, $M = 1.22$) recall activities, $t(152) = 5.03$, $p < .001$, 95% CI [0.23, 0.53], $d = 0.41$.

Overall performance prediction indices were also calculated in the same manner as Study 1, revealing that participants demonstrated overall metamotivational accuracy (see Table 11) in their performance predictions. Once again, there was substantial variability in the accuracy of participants' knowledge (see Figure 12).
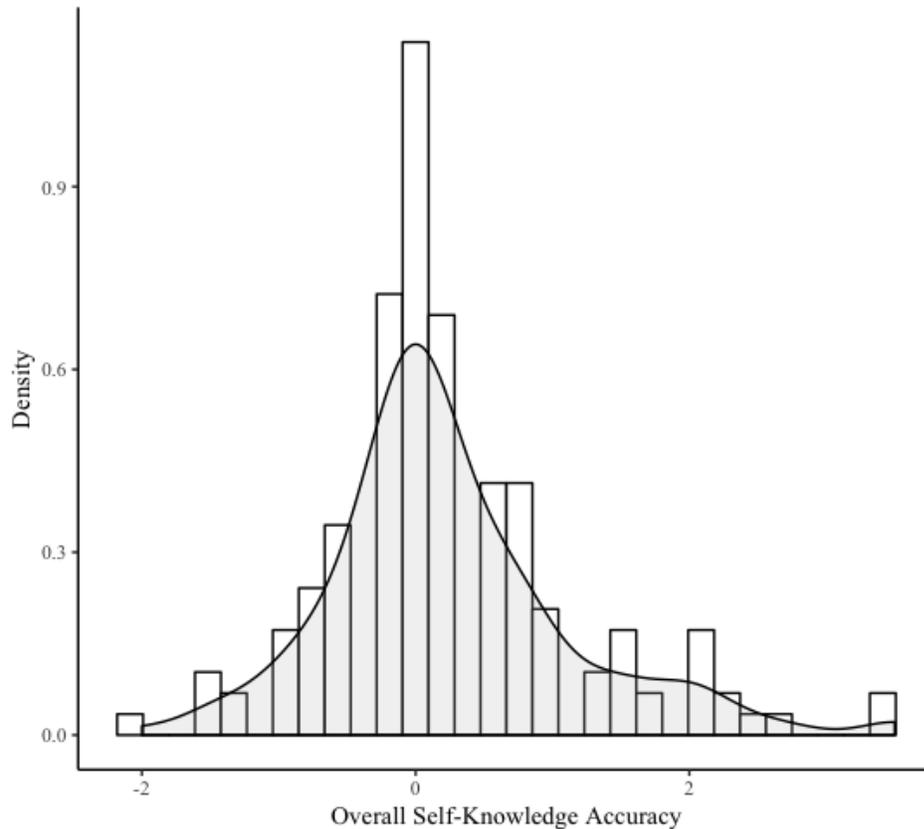
Figure 12. Density plot of overall self-knowledge accuracy in Study 2.

Study 3

Leader Sample. A two (task type: eager versus vigilant) by two (recall activity: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task type, $F(1, 180) = 19.33$, $p < .001$, $\eta_p^2 = .10$, 90% CI [0.04, 0.17]. Replicating Study 1 and 2, participants expected to perform better at vigilant tasks ($M = 5.34$, $SD = 0.98$) than eager tasks overall ($M = 5.16$, $SD = 1.00$), $t(180) = 4.40$, $p < .001$, 90% CI [0.10, 0.25], $d = 0.33$. There was also a significant main effect of recall activity, $F(1, 180) = 24.75$, $p < .001$, $\eta_p^2 = .12$, 90% CI [0.06, 0.20], such that participants expected to perform better after hypothetically engaging in promotion-focused recall activities ($M = 5.43$, $SD = 0.99$) than prevention-focused recall activities overall ($M = 5.06$, $SD = 1.16$), $t(180) = 5.00$, $p < .001$, 95% CI [0.22, 0.52], $d = 0.28$.

These main effects were qualified by the predicted task by recall interaction, $F(1, 180) =$ 33.69, $p < .001$, $\eta_p^2 = .16$, 90% CI [0.08, 0.24], also replicating Study 1 and 2 (see Figure 16). Examining the simple effects of recall type, participants expected to perform better after hypothetically engaging in prevention-focused recall activities before vigilant tasks ($M = 5.28$, $SD = 1.10$) than eager tasks ($M = 4.84$, $SD = 1.36$), $t(180) = 6.87$, $p < .001$, 95% CI [0.32, 0.57], $d = 0.51$. There was no difference in participants' performance expectancies after hypothetically engaging in promotion-focused recall activities before eager tasks ($M = 5.48$, $SD = 0.98$) and vigilant tasks ($M = 5.39$, $SD = 1.13$), $t(180) = 1.60$, $p = .112$, 95% CI [-0.02, 0.19], $d = 0.12$.

Conversely, examining the simple effects of task type revealed that participants expected to perform better at eager tasks after hypothetically engaging in promotion-focused recall activities ($M = 5.48$, $SD = 0.98$) versus prevention-focused recall activities ($M = 4.84$, $SD = 1.36$), $t(180) = 6.67$, $p < .001$, 95% CI [0.45, 0.82], $d = 0.50$. There was no significant difference in participants' performance expectancies for vigilant tasks after hypothetically engaging in promotion-focused ($M = 5.39$, $SD = 1.13$) versus prevention-focused recall activities ($M = 5.28$, $SD = 1.10$), $t(180) = 1.31$, $p = .192$, 95% CI [-0.05, 0.26], $d = 0.10$.

Replicating Study 1 and 2, overall and task specific recall performance prediction indices were also calculated in the same manner as Studies 1 and 2. Overall, participants demonstrated metamotivational accuracy in their performance predictions (see Table 11), and variability in this accuracy (see Figure 13).
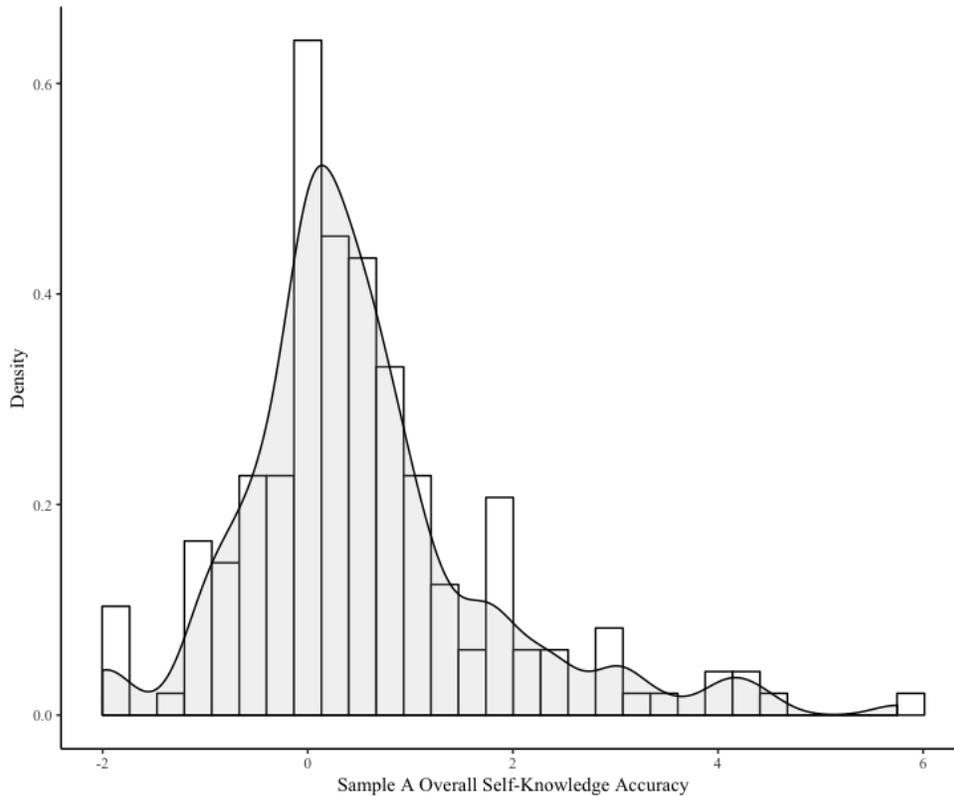
Figure 13. Density plot of overall self-knowledge accuracy in Study 3—Leader Sample.

Student Sample. A two (task type: eager versus vigilant) by two (recall activity: promotion versus prevention) repeated measures ANOVA revealed no significant main effect of task type, $F(1, 197) = 0.91$, $p = .342$, $\eta_p^2 = .01$, 90% CI [0.00, 0.03]. Consistent with past results, there was a significant main effect of recall activity, $F(1, 197) = 100.12$, $p < .001$, $\eta_p^2 = .34$, 90% CI [0.25, 0.41], such that participants expected to perform better after hypothetically engaging in promotion-focused recall activities ($M = 5.04$, $SD = 0.84$) than prevention-focused recall activities overall ($M = 4.43$, $SD = 0.91$), $t(197) = 10.01$, $p < .001$, 95% CI [0.49, 0.73], $d = 0.71$.

This main effect was qualified by the predicted task by recall interaction, $F(1, 197) = 47.96$, $p < .001$, $\eta_p^2 = .20$, 90% CI [0.11, 0.27] (see Figure 16). Examining the simple effects of recall type, participants expected to perform better after hypothetically engaging in promotion-focused activities before eager tasks ($M = 5.16$, $SD = 0.94$) than vigilant tasks ($M = 4.92$, $SD =$

84

0.92), $t(197) = 4.45$, $p < .001$, 95% CI [0.14, 0.35], $d = 0.32$. Participants also expected to perform better after hypothetically engaging in prevention-focused recall activities before vigilant tasks ($M = 4.60$, $SD = 0.93$) than eager tasks ($M = 4.27$, $SD = 1.08$), $t(197) = 5.15$, $p < .001$, 95% CI [0.20, 0.45], $d = 0.37$.

Conversely, examining the simple effects of task type revealed that participants expected to perform better at eager tasks after hypothetically engaging in promotion-focused recall activities ($M = 5.16$, $SD = 0.94$) versus prevention-focused recall activities ($M = 4.27$, $SD = 1.08$), $t(197) = 11.15$, $p < .001$, 95% CI [0.73, 1.05], $d = 0.79$. Finally, participants expected to perform better vigilant tasks after hypothetically engaging in promotion-focused ($M = 4.92$, $SD = 0.92$) versus prevention-focused recall activities ($M = 4.60$, $SD = 0.93$), $t(197) = 4.92$, $p < .001$, 95% CI [0.19, 0.45], $d = 0.35$.

Similar to the leader sample, overall and task specific recall performance prediction indices showed that participants demonstrated overall metamotivational accuracy (see Table 11) and significant variability in their performance predictions (see Figure 14).
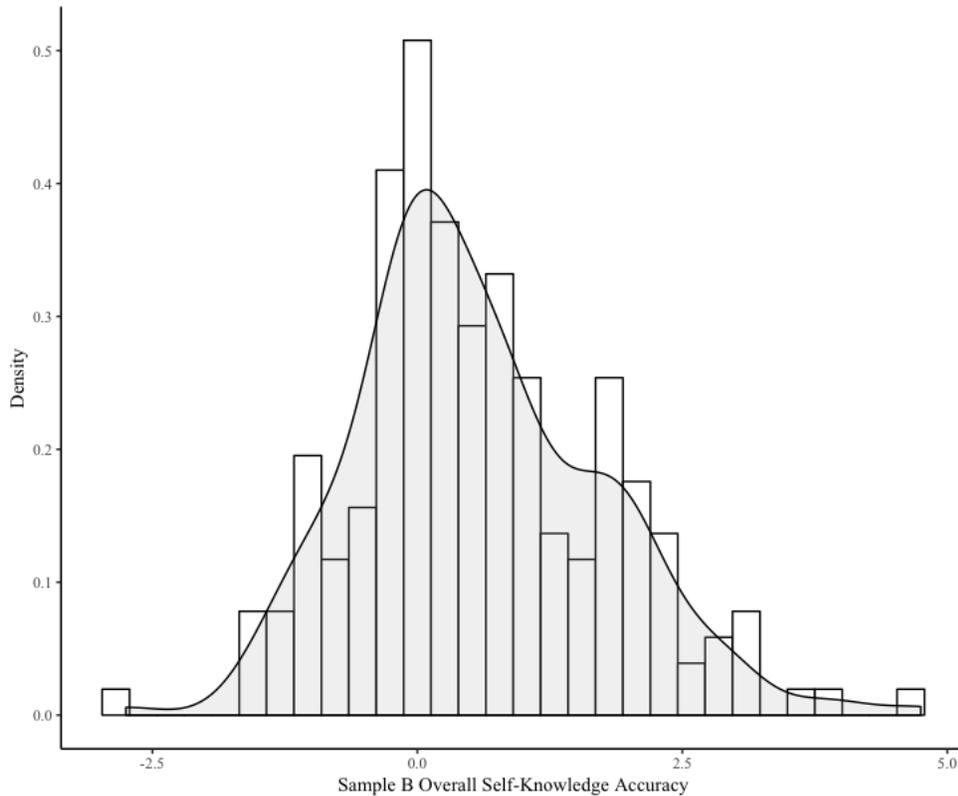
Figure 17. Density plot of overall self-knowledge accuracy in Study 3—Student Sample.

Study 4

A two (task type: eager versus vigilant) by two (recall activity: promotion versus prevention) repeated measures ANOVA revealed a significant main effect of task type, $F(1, 181)$ = 16.22, $p < .001$, $\eta_p^2 = .08$, 90% CI [0.03, 0.15]. Replicating previous studies, participants expected to perform better at vigilant tasks ($M = 5.25$, $SD = 1.09$) than eager tasks overall ($M =$ 5.02, $SD = 1.16$), $t(181) = 4.03$, $p < .001$, 90% CI [0.12, 0.34], $d = 0.30$. Once again, there was a significant main effect of recall activity, $F(1, 181) = 18.38$, $p < .001$, $\eta_p^2 = .09$, 95% CI [0.04, 0.16], such that participants expected to perform better after hypothetically engaging in promotion-focused recall activities ($M = 5.36$, $SD = 1.04$) than prevention-focused recall activities overall ($M = 4.91$, $SD = 1.26$), $t(181) = 6.78$, $p < .001$, 95% CI [0.32, 0.59], $d = 0.50$.

These main effects were qualified by the predicted task by recall interaction, $F(1, 181) =$ 46.02, $p < .001$, $\eta_p^2 = .20$, 90% CI [0.12, 0.28], also replicating previous studies (see Figure 16). Examining the simple effects of recall type, participants expected to perform better after hypothetically engaging in prevention-focused recall activities before vigilant tasks ($M = 5.12$, $SD = 1.27$) than eager tasks ($M = 4.70$, $SD = 1.45$), $t(181) = 5.23$, $p < .001$, 95% CI [0.26, 0.57], $d = 0.39$. There was no difference in participants' performance expectancies after hypothetically engaging in promotion-focused recall activities before eager tasks ($M = 5.34$, $SD = 1.14$) and vigilant tasks ($M = 5.39$, $SD = 1.11$), $t(181) = -0.73$, $p = .465$, 95% CI [-0.17, 0.08], $d = 0.05$.

Conversely, examining the simple effects of task type revealed that participants expected to perform better at eager tasks after hypothetically engaging in promotion-focused recall activities ($M = 5.34$, $SD = 1.14$) than prevention-focused recall activities ($M = 4.70$, $SD = 1.45$), $t(181) = 7.32$, $p < .001$, 95% CI [0.47, 0.54], $d = 0.54$. Participants also expected to perform better at vigilant tasks after hypothetically engaging in promotion-focused ($M = 5.39$, $SD = 1.11$) versus prevention-focused recall activities ($M = 5.12$, $SD = 1.27$), $t(181) = 3.81$, $p < .001$, 95% CI [0.13, 0.41], $d = 0.28$.

Replicating prior studies, overall and task specific recall performance prediction indices showed that participants demonstrated overall metamotivational accuracy (see Table 11) and variability in their performance predictions (see Figure 15).
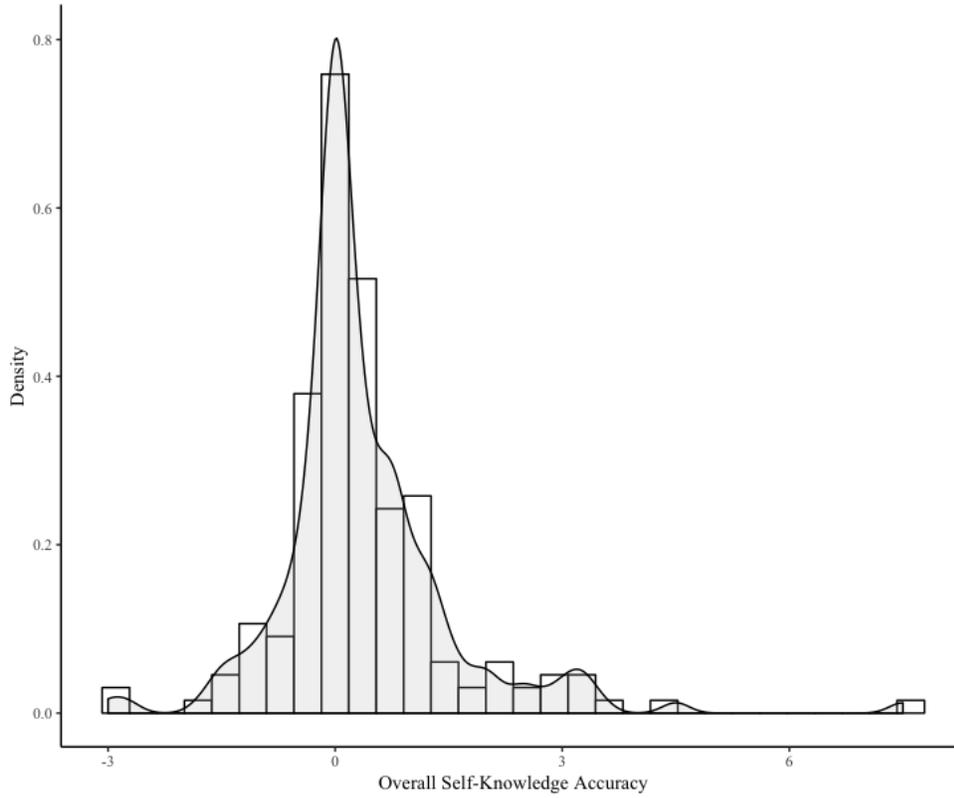
Figure 15. Density plot of overall self-knowledge accuracy in Study 4.

Table 11

Accuracy indices for overall self-knowledge in Study 1 – 4.

Study	M (SD)	t	df	p	95% CI	
					Lower	Upper
1	0.33 (1.45)	2.98	167	.003	0.11	0.55
2	0.25 (0.91)	3.39	151	.001	0.10	0.39
3 (Leaders)	0.53 (1.24)	5.80	180	< .001	0.35	0.71
3 (Students)	0.57 (1.15)	6.93	197	< .001	0.41	0.73
4	0.37 (1.16)	7.21	181	< .001	0.20	0.54

* One sample *t*-tests indicate whether each accuracy index is significantly different from zero.
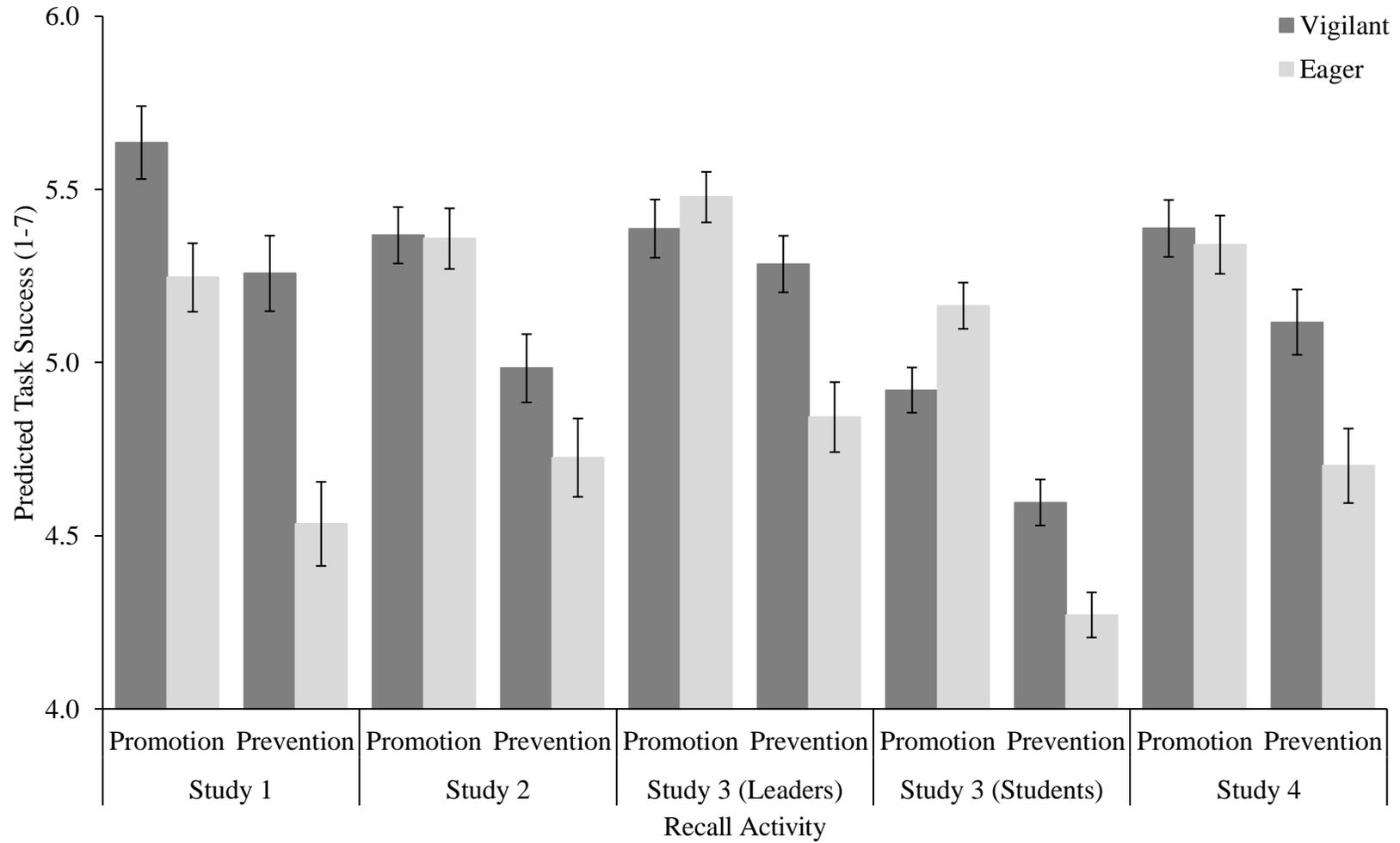
Figure 16. Results of the self-knowledge assessment as a function of task type and recall type (Study 1 − 4). Error bars indicate ± 1 SE.