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Perspectives on prediction: Does third-person imagery improve task completion estimates?

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ABSTRACT

People typically underestimate the time necessary to complete their tasks. According to the planning fallacy model of optimistic time predictions, this underestimation occurs because people focus on developing a specific plan for the current task and neglect the implications of past failures to meet similar deadlines. We extend the classic planning fallacy model by proposing that a phenomenal quality of mental imagery – the visual perspective that is adopted – may moderate the optimistic prediction bias. Consistent with this proposal, participants in four studies predicted longer completion times, and thus were less prone to bias, when they imagined an upcoming task from the third-person rather than first-person perspective. Third-person imagery reduced people's focus on optimistic plans, increased their focus on potential obstacles, and decreased the impact of task-relevant motives on prediction. The findings suggest that third-person imagery helps individuals generate more realistic predictions by reducing cognitive and motivational processes that typically contribute to bias.

Introduction

Anecdotes, intuition, and empirical research all suggest that people typically underestimate how long it will take to finish upcoming tasks or projects. Much of the empirical research examining task completion predictions has documented a phenomenon known as the "planning fallacy" (Kahneman & Tversky, 1979), a form of optimistic bias wherein people underestimate the time it will take to complete an upcoming task even though they realize that similar tasks have typically taken longer than expected (for a review see Buehler, Griffin, & Ross, 2002). The basic tendency to underestimate completion times has been observed for a wide range of personal, academic, and work-related tasks by individuals and by groups (e.g., Buehler & Griffin, 2003; Buehler, Griffin, & Ross, 1994; Byram, 1997; Connolly & Dean, 1997; Kruger & Evans, 2004; Roy, Christenfeld, & McKenzie, 2005; Taylor, Pham, Rivkin, & Armor, 1998).

The tendency to underestimate task completion times has important implications for organizations and individuals as such unrealistic forecasts and optimistic plans can have serious economic, personal, and social consequences. The present research explores a perceptual factor – the visual perspective or point of view that people adopt as they envision an upcoming task – that may moderate the optimistic bias in prediction and provide a promising approach to debiasing. The third-person perspective should, according to relevant theory, serve to counteract cognitive and motivational processes that typically contribute to optimistic bias in task predictions. Thus we propose that people will generate longer, and hence more realistic, task completion predictions when they imagine a future task from a third-person rather than a first-person perspective.

Cognitive and motivational sources of bias

There are a number of well-documented processes that explain why people underestimate task completion times. According to cognitive processing accounts, the bias stems largely from the kinds of information that people focus on when generating predictions. In particular, when generating a task completion prediction, people's natural inclination is to focus exclusively on the specific steps that they need to take to complete a project at the desired time (Buehler et al., 1994, 2002; Kahneman & Tversky, 1979). However, given the vast number of potential impediments, there is a great likelihood that any given project will encounter some unexpected problems, delays, and interruptions. When people focus narrowly on a plan for successful task completion, they neglect other sources of information – such as past completion times, competing priorities, and factors that may delay their progress – that could help them to generate more realistic predictions. Evidence of these myopic planning processes comes from studies in which people describe their thoughts while predicting when they will finish an upcoming project. Most descriptions focus on specific future plans whereas very few descriptions mention potential

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obstacles and delays (Buehler, Griffin, & MacDonald, 1997; Buehler, Messervey, & Griffin, 2005; Buehler et al., 1994). In addition, experiments have shown that people who are instructed explicitly to focus on developing a concrete, step-by-step plan for a task make more optimistic predictions than those who are not (Buehler & Griffin, 2003). These findings imply that unrealistic predictions are caused, at least in part, by a tendency to focus narrowly on a plan for successful task completion.

Motivational factors also contribute to prediction bias. Theories of motivated reasoning (Kunda, 1990) and desirability bias (Krizan & Windschitl, 2007) suggest that predictions in many domains are biased by people's hopes, wishes, and desires. When considering an upcoming task, one pervasive motivation that could potentially bias people's predictions is the desire to finish as soon as possible. For example, even when tasks have a clear external deadline, people often hope to finish well in advance of the due date. Consistent with the motivational accounts, research on task completion predictions has shown that a motivation to finish tasks early, such as that produced by monetary incentives (Buehler et al., 1997; Byram, 1997) or the desire to please others (Pezzo, Pezzo, & Stone, 2006), increases the optimistic prediction bias. Furthermore, mediational analyses suggest that the desire to finish an upcoming task elicits optimistic predictions because it heightens people's tendency to focus narrowly and myopically on a plan for task completion (Buehler et al., 1997).

Actor–observer differences

Research has also identified factors that moderate or limit the tendency to underestimate task completion times (for reviews see Buehler et al., 2002; Roy et al., 2005), including one that is highly pertinent to the present study of perspective. When people make predictions concerning others' tasks, rather than their own, they are less prone to underestimate completion times (Buehler et al., 1994; Newby-Clark, Ross, Buehler, Koehler, & Griffin, 2000). For example, Buehler et al. (1994) asked participants to predict when an upcoming computer assignment would be finished and to list their thoughts while generating the predictions. Observer participants reviewed the responses, tried to predict when the actors would actually finish the assignment, and listed their own thoughts as they arrived at their predictions. Whereas the actors predicted to finish earlier than they actually did, the observers did not exhibit this bias.

The actor–observer difference in predictions appears to reflect differences in the underlying cognitive and motivational processes that give rise to optimistic bias. As noted previously, actors fall prey to bias in part because they focus narrowly on a plan for successful task completion. Observers typically do not have access to the wealth of information that actors possess about their future plans and life circumstances, making it difficult for observers to focus narrowly on a plan for completing the task by a desired time. Thus observers may be more likely to "step back" and contemplate a broader spectrum of information, including potential obstacles to speedy task completion. In addition, neutral observers do not generally share the same motivations as actors (e.g., the motivation to complete an upcoming task promptly), and thus observers' predictions are less likely to be influenced by these motives.

Consistent with this account, Buehler et al. (1994) found that observers were less likely than actors to base predictions on a specific plan for task completion, and were more likely to consider problems the actor might encounter. Along similar lines, studies have shown that prompting individuals to contemplate worst-case scenarios of task completion (which included myriad obstacles, interruptions, and delays) led them to predict later completion times for another individual, but had no impact on predictions concerning their own tasks (Newby-Clark et al., 2000). Again this suggests that observers are guided less by their desires, and thus are more receptive to the possibility of obstacles than are actors. Similar actor–observer differences have been found in predictions concerning various desirable outcomes, such as donating to charity and enjoying a long and happy romantic relationship (e.g., Epley & Dunning, 2000; MacDonald & Ross, 1999; Vietri, Chapman, & Schwartz, 2009). In each case the actors focused narrowly on the desirable outcomes, whereas observers considered factors that could work against these outcomes. Together these findings suggest that neutral observers are less inclined than actors to base predictions on an optimistic, plan-based scenario, and are more inclined to consider potential obstacles.

Notably, not all studies find this actor–observer difference in prediction. Byram (1997) asked participants to build a computer stand in the lab and found that participants underestimated the time it would take, to an equal degree, whether their predictions concerned themselves or the average person. Hinds (1999) examined predictions of the time it would take new users of a cell phone to perform voicemail tasks. Estimates were obtained from a group of observers highly experienced with the tasks (experts) and a group with limited experience (intermediate users) as well as from the novice users themselves. Although participants generally underestimated the time novice users would require, this bias was greater in expert observers and lower in intermediate observers than in the actor participants themselves. These findings indicate that observers do not always generate more realistic predictions than actors.

A noteworthy feature of the latter two studies is that they examined predictions of task duration (i.e., the time spent working on a task) whereas those finding reduced bias among observer participants examined predictions of task completion time (i.e., the date by which a task will be finished). These are very different predictions, and their accuracy depends on different factors. Task completion times depend not only on the duration of the task itself, but are also subject to a host of external factors such as interruptions, distractions, and competing demands from other tasks. Thus it seems plausible that the reduction in bias found in observer predictions of completion time but not task duration reflects the additional considerations that apply uniquely to predictions of task completion. Given that the present studies targeted predictions of task completion time (rather than task duration), the theorizing we develop below is guided primarily by the actor–observer studies that examined task completion predictions.

The role of imagery perspective

The preceding literature review suggests that optimistic predictions of task completion time stem from a tendency to focus narrowly on a scenario, or mental image, of the path leading to a successful task completion, a tendency that is enhanced when predictors have a strong desire to complete the task early (e.g., Buehler et al., 1997), and is attenuated in predictions generated by neutral observers (e.g., Buehler et al., 1994). The main purpose of the present research was to explore the influence of imagery perspective on people's predictions concerning their own upcoming tasks. Given the central role of imagery in these predictions, we reasoned that it may be possible to alter people's predictions by altering the visual perspective or point of view that they adopt as they imagine the future task unfolding. Thus a novel contribution of the present research is that it tests whether people can be induced to take on an observer-like perspective even when making predictions concerning their own future tasks, and whether the adoption of this perspective is an effective strategy for debiasing predictions of task completion time.

Our work is motivated by previous research and theory which indicates that when people imagine their future actions they often generate visual imagery (Atance & O'Neill, 2001; Marks, 1999), and

generally adopt one of two visual perspectives (Libby & Eibach, 2002; Nigro & Neisser, 1983; Pronin & Ross, 2006). People who adopt a *first-person* perspective see the event from the same visual perspective as they would if they were actually carrying it out; in their mental image they are looking out at their surroundings through their own eyes. People who adopt a *third-person* perspective see the event from an observer's visual perspective; in their mental image they see themselves as part of the field of view, as well as their surroundings. A defining attribute of third-person imagery is that individuals "see themselves" acting, much like an onlooker would.

How might these differences in imagery perspective affect people's predictions about themselves in the future? Research to date has not yet addressed this question. However previous work has identified several determinants and consequences of imagery perspective, both for imagined future events (e.g., Libby & Eibach, 2002, Study 4; Libby, Shaeffer, Eibach, & Slemmer, 2007; Pronin & Ross, 2006) and remembered past events (e.g., Frank & Gilovich, 1989; Kross, Ayduk, & Mischel, 2005; Libby & Eibach, 2002; Lorenz & Neisser, 1985; McIsaac & Eich, 2002; Robinson & Swanson, 1993; Sanitioso, 2007) that we believe could counteract the cognitive and motivational processes that typically result in optimistic bias. Consequently our main hypothesis was that third person imagery would reduce people's tendency to underestimate task completion times.

Hypothesis 1. People will predict longer task completion times, and thus be less prone to underestimate actual completion times, when they imagine the future task from a third-person rather than a first-person perspective.

We further propose that this hypothesized effect of imagery perspective on prediction will reflect both cognitive and motivational underpinnings of prediction. First, we suggest that imagery perspective could affect people's cognitive approach to prediction: Adopting a third-person perspective, as opposed to a first-person perspective, tends to elicit cognitive processes that are more similar to those found in neutral observers than in actors (Frank & Gilovich, 1989; Pronin & Ross, 2006; Robinson & Swanson, 1993). Robinson and Swanson (1993) proposed that the first- and third-person perspectives activate cognitive processes typically associated with the corresponding roles of actor and observer. For example, whereas observers typically try to understand why a person is acting in a particular way, actors are actively engaged in goal pursuit and thus focus on plans for accomplishing their goals. Along similar lines, research on attribution has found that individuals prompted to recall or imagine an event from a third-person perspective make attributions that more closely resemble those typically made by observers than those made by actors (Frank & Gilovich, 1989; Pronin & Ross, 2006). On the basis of this research, we reasoned that generating third-person imagery would lead people to think about their futures much like an outside observer would. Accordingly, people who imagine an upcoming task from the third-person perspective would be less inclined to focus on plans and more inclined to consider potential obstacles and as a result would predict longer task completion times.

Hypothesis 2. Effects of imagery perspective on prediction will be mediated by people's cognitive focus as they generate predictions: Specifically, third-person imagery will reduce people's tendency to focus narrowly on plans (Hypothesis 2a), and will increase their focus on potential obstacles (Hypothesis 2b).

Second, we suggest that imagery perspective will alter the salience and intensity of people's engagement with the target event. People tend to experience stronger affective involvement with an event when they generate first-person, rather than third-person, imagery (Kross et al., 2005; Lorenz & Neisser, 1985; McIsaac & Eich, 2002; Pronin & Ross, 2006; Robinson & Swanson, 1993). For example, in first-person memories people report rich accounts of the affective reactions, physical sensations, and psychological states they experienced during the event (McIsaac & Eich, 2002; Robinson & Swanson, 1993). People who adopt a third-person perspective remain relatively dispassionate, objective, and removed. In short, the third-person perspective appears to reduce the salience of internal states (emotion, motivation) accompanying an event. In the realm of planning and prediction, task relevant feelings and motives (such as the motivation to finish a task early) may be less vivid and cognitively available to people who imagine the task from the third-person perspective and hence be weighted less heavily in prediction.

Hypothesis 3. Imagery perspective will moderate the role of motivation in prediction. People's desire to finish a task promptly will be attenuated (Hypothesis 3a), and weighted less heavily (Hypothesis 3b), when they adopt a third-person rather than a first-person perspective.

In sum, we propose that third-person imagery will serve to attenuate cognitive and motivational processes that contribute to optimistic forecasts. Although these same processes (i.e., focusing on plans and desired completion times) might also affect when people actually finish tasks (e.g., Gollwitzer, 1999; Taylor et al., 1998), previous research suggests that they tend to have a greater impact on predicted than on actual completion times (Buehler & Griffin, 2003; Buehler et al., 1997). Thus, to the extent that third-person imagery leads people to predict later task completion times, it should also make them less prone to underestimate their actual completion times.

Our hypotheses extend previous theory and research in an important new direction. Whereas previous work has compared predictions made by actors and observers, ours is the first to examine the effects of taking an observer perspective to generate predictions concerning one's own future behavior. Additionally our studies will extend the literature on imagery perspective: Although previous work has identified several psychological consequences of third-person imagery that we expect to influence people's predictions (e.g., third person imagery is less emotional and detailed), it has not yet linked these qualities to behavioral prediction. Thus we make a novel contribution by testing whether qualities of third person imagery can influence an important type of cognitive judgment (behavioural prediction) in a domain with important real life consequences. The practical upshot of our hypotheses is that by adopting the third-person perspective people could gain the benefits of observer-based predictions, without needing to actually consult with others.

Overview of the present studies

In each of four studies, participants identified a specific upcoming task, imagined it unfolding (e.g., the steps they would take to carry it out, potential obstacles they could encounter, etc.), and predicted when they would complete it. We measured (Study 1) or directly manipulated (Studies 2–4) the perspective participants adopted as they imagined themselves carrying out the task. In the first two studies, participants later reported their actual completion times, so that we could assess the relation between imagery perspective and the optimistic bias in prediction.[1] In the next two

[1] Although there are various forms of prediction accuracy (e.g., correlational accuracy, prediction bias; Buehler et al., 1994; Epley & Dunning, 2006), we focused primarily on prediction bias because it is arguably most consequential for real world time forecasts. Even if people's predicted completion times are correlated with their actual times (i.e., correlational accuracy) a systematic tendency to underestimate actual completion times (i.e., prediction bias) is likely to have serious ramifications. Thus our main objective was to document and explore effects on prediction bias.

studies, our main objective was to understand the process by which imagery perspective influences prediction. Thus we focused our efforts on exploring cognitive and motivational mechanisms at the time of prediction, and we did not track actual completion times in these two studies. The studies introduced measures and manipulations to capture the cognitive and motivational processes underlying effects of visual perspective on prediction.

Study 1

The first study provided a test of Hypothesis 1 by examining whether the visual perspective that is naturally adopted when imagining a future task is related to task completion predictions. Participants imagined themselves completing an upcoming task, reported whether they had adopted primarily a first-person or third-person perspective, and then predicted when the task would be finished. Participants were later asked to report their actual completion times in a follow-up survey.

Method

Participants

Participants in the initial session were 47 introductory psychology students (31 women, 16 men) who were compensated with course credit. The follow-up survey was completed by 43 participants (29 women, 14 men).

Procedure

Participants were first instructed to identify a major task they hoped to complete in the next two weeks, such as a school project (e.g., writing a paper), a personal project (e.g., writing a letter), or a household project (e.g., painting your room). Additionally, to ensure that participants were free to complete the project at any time, they were told that the project should not have a deadline within the two week period. Thus participants identified projects they wanted to finish, but did not need to finish, within the next two weeks. This task elicitation procedure has several advantages: it creates a standard, continuous scale for prediction (ranging from 1 to 14 days), it identifies tasks that participants are personally motivated to complete (i.e., they are not simply meeting an external deadline), and it avoids error variability that would be produced by differing deadlines within the target time period. A potential drawback is that participants may nominate tasks that are unlikely to be finished within the target time period.

After nominating a task, participants completed a guided imagery procedure in which they were instructed to visualize the task unfolding. They were informed at the outset that they would later make judgments about the project, including when they expected to finish it, and thus a purpose of the visualization exercise was to help them arrive at a prediction. Participants were then instructed to spend a few minutes forming a clear, visual image of the project, as follows. "Try to picture in your mind how the project is likely to unfold, including details such as when, where, and how it will be done. For example, you could picture the steps you will take to complete the project. You could think of potential problems, interruptions, or distractions that may arise and how these would affect you. Make an effort to really "see" how the project is likely to unfold".

Next, a measure of imagery perspective was obtained. Participants were told that people can imagine future events from different perspectives, and were provided with brief descriptions of the first-person perspective (i.e., people see events through their own eyes, just as they would when they were actually occurring) and third-person perspective (i.e., people see themselves and their surroundings, just as an onlooker would). They were asked to select the description that best described their own visual image of the upcoming project. Participants were then asked to predict when the project would most likely be finished on a scale ranging from 1 to 14 days. Finally, two weeks later, participants were sent a follow-up e-mail survey asking them to report whether, and when, the project was actually finished.

Results and discussion

Analyses were performed on the participants who completed both the initial questionnaire and follow-up survey. These participants did not differ from the others on measures obtained at the initial session ($ps > .20$). Responses to the follow-up survey indicated that the majority of participants (69.8%) did not end up completing their target project in the two week period and we were unable to record their actual completion date. Thus although we can say with confidence that the predicted completion times ($M = 11.44$ days, $SD = 2.58$) were overly optimistic, we were not able to quantify the degree of optimistic bias. Of greater theoretical interest, however, the predicted completion times were related to whether participants spontaneously generated third-person ($n = 14$) or first-person ($n = 29$) imagery. Participants predicted they would take significantly longer to finish their tasks when they generated third-person ($M = 12.79$, $SD = 1.85$) rather than first-person imagery ($M = 10.79$, $SD = 2.65$), $t(41) = 2.53$, $p < .05$.

The findings support the initial hypothesis: Individuals who generated third-person imagery predicted longer completion times, and thus were less prone to the prevailing optimistic bias, than those who generated first-person imagery. A strength of the study is that it examined personally relevant real-world projects and naturally occurring differences in imagery perspective, thereby increasing ecological validity. We also gained information about the relative prevalence of the two imagery perspectives: Left to their own devices, approximately two thirds of the participants reported taking a first-person perspective and one third reported taking a third-person perspective. This implies that there is considerable room for interventions to increase the use of third-person imagery.

There are two noteworthy limitations. First, due to the correlational nature of the study, we cannot conclude that visual perspective had a causal impact on prediction. Also, because the majority of participants did not finish their nominated tasks within the target time period, we were not able to assess the magnitude of prediction bias or its association with imagery perspective. These limitations are addressed in the next study.

Study 2

The main purpose of this study was to test whether imagery perspective affects the degree of optimism in task completion predictions. To address the limitations of the initial correlational study, we modified the procedure in two ways. We manipulated imagery perspective experimentally by instructing participants to imagine their upcoming task either from a first- or third-person perspective. Also, to ensure that participants nominated tasks they would actually complete prior to the follow-up survey, we asked them to identify a project with a firm deadline within the target time period.

Method

Participants

Participants in the initial session were 66 introductory psychology students (42 women, 24 men) who were compensated with course credit. The follow-up survey was completed by 46 participants (28 women, 18 men).

Procedure

Participants were first asked to identify a major project that they needed to complete some time within the next 30 days (i.e., a project with a firm deadline). Participants described the project briefly and indicated the deadline date. Next, the experimenter led participants through a visualization exercise that constituted the experimental manipulation. She informed participants that they would soon be asked to visualize the upcoming project, and provided them with instructions and practice. Participants were informed that people may "see" a future event from different perspectives and were randomly assigned to adopt either the third-person perspective (i.e., you see the event unfolding from an observer's visual perspective; you are able to see yourself, as well as your surroundings) or the first-person perspective (i.e., you see the event unfolding as you would when it is actually occurring; you are looking out at your surroundings through your own eyes). To practice adopting the assigned perspective, participants closed their eyes and pictured themselves riding a bike down the street, and described aloud what they were seeing. Participants were then asked to take at least 1 min to visualize the target task unfolding (just as in Study 1, but from the assigned perspective).

Immediately after the visualization procedure, participants completed a questionnaire that asked them to predict when in the next 30 days the project would most likely be finished. After generating their prediction, participants were asked to think back to the visualization exercise and answer several questions about it. First, as a manipulation check, they rated the extent to which they had adopted a first-person vs. a third-person perspective (0 = *totally first-person*, 5 = *combination of both*, 10 = *totally third-person*).[2,3] As supplementary measures, they rated the extent to which: it was difficult to imagine the project from the assigned perspective (0 = *extremely easy*, 10 = *extremely difficult*); the assigned perspective was similar to the way they normally thought about future projects (0 = *very different from my normal thoughts*, 10 = *very similar to my normal thoughts*); and the visual image was clear and vivid (0 = *not at all clear and vivid*, 10 = *extremely clear and vivid*). Participants were contacted by e-mail one week after the stated deadline and asked to report when the project was actually finished.

Results and discussion

Analyses were again performed on the sample of participants who completed the prediction questionnaire and follow-up survey. All these participants had finished the target project. There were no significant differences between the participants who responded to the follow-up survey and those who did not respond on measures obtained at the initial session (*ps* > .20).

Manipulation check

Participants reported adopting a third-person perspective (relative to a first-person perspective) to a greater extent in the third-person condition ($M = 4.88$, $SD = 2.17$) than in the first-person condition ($M = 2.19$, $SD = 1.60$), $t(44) = 4.71$, $p < .001$. Additional supplementary measures revealed that participants in the first- and third-person conditions did not differ in the extent to which: the assigned perspective was difficult to adopt, $t(44) = .38$, *ns*, the assigned perspective was similar to their normal thoughts about projects, $t(44) = .54$, *ns*, or the visual image was clear and vivid, $t(44) = .23$, *ns*. Also, these supplementary measures were not significantly correlated with predicted or actual completion times.

Predicted and actual completion time

In this study, the target tasks had external deadlines and thus to control for variation in the length of the deadline, each predicted and actual completion time was converted to a number of days before deadline (see also Buehler et al., 1997; Newby-Clark et al., 2000). Overall, participants tended to underestimate, at least marginally, how long their projects would take. They expected to finish further before the deadline ($M = 2.83$ days, $SD = 3.62$) than they actually did ($M = 1.74$ days, $SD = 4.20$), $t(45) = 1.85$, $p = .07$. More importantly, consistent with Hypothesis 1, the bias was affected by imagery perspective. As shown in Table 1, participants expected to finish further before the deadline in the first-person than in the third-person condition, $t(44) = 2.09$, $p < .05$, however, actual completion times did not differ across condition, $t(44) = .17$, *ns*. Consequently, the prediction bias was significantly greater in the first-person ($M = 2.38$, $SD = 4.25$) than in the third-person condition ($M = .00$, $SD = 3.45$), $t(44) = 2.10$, $p < .05$. Comparisons of predicted and actual completion times within the two conditions revealed a significant optimistic bias in the first-person condition, $t(20) = 2.57$, $p < .05$, but not in the third-person condition, $t(24) = 0.00$, *ns*.

Predicted completion times were correlated with actual completion times: those participants who predicted they would finish further before the deadline actually did tend to finish relatively early, $r(44) = .49$, $p < .01$. Although the predicted-actual correlation appeared to be somewhat stronger in the first-person, $r(19) = .65$, $p < .01$, than in the third-person condition, $r(23) = .31$, $p = .14$, this difference between correlations was not significant $z = 1.43$, $p = .15$.

The findings of this study provide the first experimental evidence that imagery perspective has a causal impact on task completion predictions. Predictions were less optimistic – and less biased – when participants imagined their upcoming tasks from a third-person rather than a first-person perspective.

Study 3

Study 3 was designed to examine the hypothesized cognitive and motivational processes underlying the impact of imagery per-

Table 1
Predicted and actual completion times (in days before deadline) as a function of manipulated, visual perspective (Study 2).

	Visual perspective	
	First-person	Third-person
Predicted		
M	4.00_a	1.84_b
SD	3.86	3.16
Actual		
M	1.62_b	1.84_b
SD	5.59	2.66
n	21	25

Notes. Within rows and columns, means that do not share a subscript letter differ significantly.

[2] Note that in this study, and each subsequent study, the manipulation check for perspective was obtained after participants predicted their task completion time. This ensured that the effect of the manipulation on prediction was not contaminated by asking about the perspective taken (which involved considering the alternative perspective and thus might have attenuated the effects).

[3] As this continuous measure implies, people's imagery for an event might not always be experienced as a purely first or third-person perspective but might be better captured by a continuous variable ranging from completely first-person to completely third-person perspective. However, in this and subsequent studies there were no significant within-cell correlations between the continuous perspective ratings and predicted completion times. Thus, although the experimental manipulations created differences in imagery perspective and affected prediction, variation in imagery ratings within each condition was not related to prediction. In general, this pattern is consistent with a typological "either or" conceptualization of visual perspective and less supportive of a dimensional conceptualization (Meehl, 1995).

spective on prediction. According to our theorizing, when people adopt the third-person perspective, rather than the first-person perspective, they should be less inclined to focus narrowly on optimistic plans, and more likely to consider potential obstacles. In addition, because third-person imagery tends to reduce the salience of internal states, people who adopt third-person imagery may experience less motivation to complete the task, and be less inclined to use such motives as a basis for prediction.

To test this reasoning, we asked participants to identify an upcoming task, to imagine it from a first- or third-person perspective, and to predict when it would be finished. We introduced measures to assess the focus of participants' thoughts (plans vs. obstacles) as they generated their predictions as well as their motivation to complete the task promptly. We expected that, in comparison to first-person imagery, third-person imagery would lead people to: (a) generate less optimistic predictions, (b) focus less attention on plans and more attention on potential obstacles, (c) experience less intense motivation to complete the task, and (d) rely less heavily on those motives as a basis for prediction. The present study also introduced a control condition to locate the effects of visual perspective more precisely. Given that people may be more likely to generate first-person than third-person imagery (Study 1), we expected that results in the control condition would be most similar to those in the first-person condition.

Method

Participants

Participants were 104 introductory psychology students (73 women, 31 men) who were compensated with course credit.

Procedure

We returned to the task elicitation procedure used in Study 1: Participants identified a task that they were hoping and intending to finish in the next two weeks, even though it did not have a deadline within that time period. This procedure has several advantages noted previously, and the previously salient disadvantage – that it elicits tasks that may not be finished in the target time period – was not relevant to the present study which focused only on processes occurring at the time of prediction. After identifying the target project, participants completed a visualization exercise similar to those used in the first two studies. They were randomly assigned to visualize the task unfolding from a first-person perspective, a third-person perspective, or, in the control condition, were not instructed to adopt a particular perspective. Next participants were asked to predict when in the next two weeks (i.e., from 1 to 14 days) the project was most likely to be finished. The prediction measure was accompanied by an open–ended measure of thought focus: "Please describe how you arrived at your prediction of when the project is most likely to be finished: What thoughts went through your mind as you tried to predict the completion time? What was your prediction based on?" They were provided with a lined page to write their responses, and instructed to continue on the back of the page if needed. We chose an open-ended thought listing measure because it allowed us to assess cognitive processes underlying prediction without constraining participants' responses, or suggesting to them the kinds of information that were of interest. This procedure has been effective in capturing meaningful differences in cognitive processes underlying prediction in past research (e.g., Buehler et al., 1994, 2005).

A coder who was unaware of condition rated the extent to which the participants' responses focused on their plans for successful task completion and, separately, the extent to which they focused on potential obstacles they might encounter (0 = *no focus*, 1 = *weak focus*, 2 = *moderate focus*, 3 = *strong focus*). Rated focus on plans represented the proportion of responses that described the specific steps the actor would take to carry out the project (e.g., "I thought about the steps I would have to take to in order to complete the project and how long each step would take". "I'm not busy this weekend so I can do a resume on Saturday and the cover letters on Sunday and mail them by Monday. It won't take long because my computer gives me an outline for resumes and letters, and I already have stamps and envelopes."). Rated focus on obstacles represented the proportion of the responses that described factors that could delay task completion (e.g., "The product involves complicated technology, so finding costs will be difficult." "I can see myself getting distracted by friends and not finishing the readings over reading week."). To establish inter-rater reliability, a second research assistant independently rated the responses from the first 54 participants: The coding was reliable for focus on plans ($\alpha = .88$) and focus on obstacles ($\alpha = .82$).

Participants then completed two rating scales that assessed their motivation to complete the project promptly: How motivated are you feeling to complete this project (1 = *not at all motivated*, 10 = *extremely motivated*)? How eager are you to begin working at this project (1 = *not at all eager*, 10 = *extremely eager*)? Finally, as a manipulation check, participants rated the extent to which they had visualized the project from a first-person vs. a third-person perspective (0 = *totally first-person*, 5 = *combination of both*, 10 = *totally third-person*).

Results and discussion

Manipulation check

A one-way ANOVA performed on the perspective ratings confirmed that the manipulation affected imagery perspective, $F(2,101) = 15.09$, $p < .001$. Subsequent pairwise comparisons using the Fisher LSD test indicated that participants reported adopting the third-person perspective (relative to the first-person perspective) to a greater degree in the third-person condition ($M = 5.69$, $SD = 2.19$) than in either the first-person condition ($M = 2.77$, $SD = 2.00$), $t(101) = 5.31$, $p < .001$, or the control condition ($M = 3.65$, $SD = 2.60$), $t(101) = 3.72$, $p < .001$. The first-person and control conditions did not differ significantly, $t(101) = 1.60$, $p = .11$.

Predicted completion time

We also performed a one-way ANOVA and subsequent contrasts on each dependent measure (see Table 2 for means). Consistent with Hypothesis 1, task completion predictions were affected by imagery perspective, $F(2,101) = 5.14$, $p < .01$. Participants predicted they would take longer to finish the project in the third-person than in the first-person condition, $t(101) = 3.20$, $p < .01$. Predictions in the control condition fell in between, and did not differ significantly from those in the third-person, $t(101) = 1.43$, $p = .15$, or first-person condition, $t(101) = 1.75$, $p = .08$.

The role of thought focus

Our hypotheses concerned participants' relative focus on plans and obstacles at the time of prediction, and thus we created a thought focus index by subtracting the rating of obstacles from the rating of plans. Higher scores indicated a greater focus on plans relative to obstacles. A one-way ANOVA performed on the thought focus index indicated that imagery perspective affected participants' thoughts as they generated predictions, $F(2,101) = 9.69$, $p < .001$. Subsequent pairwise comparisons supported the hypotheses. Participants focused more on obstacles than future plans in the third-person condition ($M = -.56$, $SD = 1.48$), but focused more on future plans than obstacles in the first-person condition

Table 2
Predicted days, thought focus, and motivation as a function of manipulated visual perspective (Study 3).

	Visual perspective		
	First-person	Control	Third-person
Predicted days			
M	10.34_a	11.44_{ab}	12.34_b
SD	3.14	2.54	2.04
Focus on plan			
M	1.71_a	1.44_a	$.80_b$
SD	.99	1.02	1.02
Focus on obstacles			
M	$.93_a$	$.84_a$	1.36_b
SD	.56	.56	.69
Motivation			
M	6.54_a	6.57_a	5.37_b
SD	2.09	1.75	2.69
n	35	34	35

Notes. Within rows, means that do not share a subscript letter differ significantly.

Table 3
Correlations among predicted days, thought focus, and motivation as a function of manipulated visual perspective (Study 3).

		Visual perspective		
		First-person	Control	Third-person
Prediction–thought focus	*r*	$-.55^{***}$	$-.43^{**}$	$-.39^{**}$
Prediction–motivation	*r*	$-.46^{***}$	$-.38^{**}$	−.10
Motivation–thought focus	*r*	$.29^{*}$	$.38^{**}$	−.04

* $p < .10$.
** $p < .05$.
*** $p < .01$.

($M = .79$, $SD = 1.34$, pairwise $t(101) = 4.07$, $p < .001$), and in the control condition ($M = .60$, $SD = 1.31$, pairwise $t(101) = 3.49$, $p < .001$). The latter two conditions did not differ significantly, $t(101) = .55$, *ns*. Furthermore, as hypothesized, the task completion predictions were related to the index of thought focus (see Table 3 for within cell correlations among prediction, thought focus, and motivation). Participants expected to finish earlier to the extent that they focused more on plans than on obstacles, $r(102) = -.51$, $p < .001$, and this correlation was significant within the first-person, control, and third-person conditions (rs = −.55, −.43, and −.39 respectively).

Although our primary analyses use the index of thought focus that contrasts the relative effects of plans and obstacles, it is also informative to examine separately the individual ratings that comprised the thought focus index. A limitation of an index based on difference scores is that it does not indicate the precise manner in which the two underlying components (focus on plans and obstacles) are contributing to the effects. For example, it may be that the impact of imagery perspective is attributable primarily to the focus on plans, to the focus on obstacles, or to both. The clearest support for our hypotheses would be obtained if third person imagery increased the focus on obstacles and decreased the focus on plans – and this is precisely the pattern of effects that was observed. Oneway ANOVAs revealed that imagery perspective affected the focus on plans, $F(2,101) = 7.54$, $p = .001$, and the focus on obstacles, $F(2,101) = 7.24$, $p = .001$, in opposite directions (see Table 2 for means). Furthermore, consistent with the hypotheses, the two ratings were correlated in opposite directions with predicted completion times: participants predicted they would take less time to finish when they focused more on plans, $r(102) = -.51$, $p < .01$, and less on potential obstacles, $r(102) = .32$, $p < .001$. Similarly, an analysis that regressed predicted completion times simultaneously on the focus on plans and obstacles revealed that the two ratings were related to predictions in opposite directions, although the relation remained significant only for the focus on plans ($ß = -.47$, $p < .001$ for plans; $ß = .10$, $p = .32$ for obstacles).

We next performed mediation analyses (Baron & Kenny, 1986) to test the hypothesis that the effect of imagery perspective on prediction would be mediated by thought focus (Hypothesis 2). First, the thought focus index was regressed on dummy coded variables representing perspective (one contrasting the third-person and first-person conditions and another contrasting the third-person and control conditions). This analysis confirmed, as noted above, that imagery perspective had a significant impact on thought focus: Adopting third person imagery (vs. first person) reduced the tendency to focus narrowly on plans ($ß = -.43$, $t(101) = 4.07$, $p < .001$). Next, predicted completion times were regressed on the dummy coded perspective variables (Step 1) and then also on the centered index of thought focus (Step 2). The effect of imagery perspective (third-person vs. first person) that was significant in Step 1 ($ß = -.35$, $t(101) = 3.20$, $p < .01$) was attenuated when thought focus was entered ($ß = -.15$, $t(100) = 1.39$, *ns*), whereas the effect of thought focus remained significant ($ß = -.48$, $t(100) = 5.14$, $p < .001$). A Sobel test using the unstandardized coefficients (and associated SEs) for the association between perspective and thought focus ($B = -1.34$, $SE = .33$) and the association between thought focus and predicted completion times ($B = -.87$, $SE = .17$) yielded a significant mediation effect, $z = 3.19$, $p < .01$. These findings indicate that the effect of imagery perspective on predicted completion times was mediated by the focus of participants' thoughts as they generated predictions. Consistent with Hypothesis 2, third-person imagery reduced the tendency to focus narrowly on plans which, in turn, resulted in longer predicted completion times.

The role of motivation

We averaged the two motivation items to create an index of participants' motivation to complete the task promptly ($\alpha = .85$). As hypothesized, motivation was affected by imagery perspective, $F(2,101) = 3.33$, $p < .05$. Participants reported lower motivation in the third-person condition than in either the first-person, $t(101) = 2.21$, $p < .05$, or the control condition, $t(101) = 2.25$, $p < .05$. The latter two conditions did not differ significantly, $t(101) = .06$, *ns*.

How was motivation related to predicted completion times? Recall that we hypothesized third-person imagery would reduce people's tendency to base predictions on current feelings of motivation. An examination of within-cell correlations supported this hypothesis. Participants who were more motivated to complete the task predicted shorter completion times within the first-person condition ($r = -.46$, $p < .01$) and control condition ($r = -.38$, $p < .05$), but not within the third-person condition ($r = -.10$, *ns*).

To explore this pattern further, predicted completion times were submitted to hierarchical regressions. Fig. 1 depicts the regression of predicted completion times on motivation separately within each perspective condition. To test whether the regression lines differed as a function of perspective, predicted completion times were regressed on the two dummy-coded variables representing perspective (third-person vs. first-person, third-person vs. control) (Step 1), the centered index of motivation (Step 2), and the perspective × motivation interaction terms (Step 3). Consistent with the hypotheses, there was a significant interaction between motivation and perspective (i.e., third-person vs. first-person contrast, $ß = -.28$, $t(98) = -2.43$, $p < .05$). This interaction indicates that motivation was a stronger determinant of predicted completion times in the first-person than in the third-person condition. There was a similar interaction pattern for the third-person

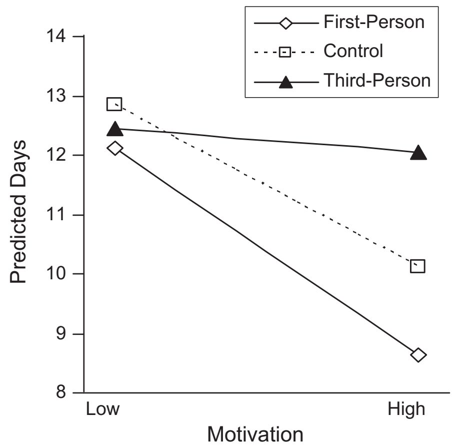

Fig. 1. Predicted days as a function of motivation (low = 1 SD below the mean; high = 1 SD above the mean) and perspective (Study 3).

vs. control contrast, though it did not attain significance, $ß = -.17$, $t(98) = 1.61$, $p = .11$.

Although the above findings support our hypothesis concerning the role of motivation (Hypothesis 3), it is worth noting that the two items comprising the motivation index differed in their emphasis on feeling motivated to finish the project or to start it. Given that these motivations are potentially distinct, and may produce different effects, we performed additional analyses that examined the two items separately. Both items yielded a very similar pattern of effects. Adopting third-person imagery (compared to first-person imagery) significantly decreased the motivation to finish the task ($p = .04$) and the motivation to start it ($p = .05$). Also, the motivation × perspective interaction effect on predicted completion times (indicating that third-person imagery attenuated the relation between motivation and prediction) appeared for both the motivation to finish ($p = .02$) and the motivation to start ($p = .04$). Thus there was no evidence that the two motivation items were differentially associated with imagery perspective or predictions of task completion time.

In summary, results supported our three central hypotheses concerning the cognitive and motivational processes underlying effects of imagery perspective. In comparison to first-person imagery, third-person imagery prompted people to predict longer completion times (Hypothesis 1), to focus less on plans and more on obstacles as they generated the predictions (Hypothesis 2), and to experience less intense motivation to complete the task and rely less heavily on such motives as a basis for prediction (Hypothesis 3). In addition, the control condition helped to locate more precisely the effects of imagery perspective. On several measures, participants in the control condition more closely resembled those in the first-person condition than those in the third-person condition. This pattern implies that the first-person perspective may be similar to the outlook that individuals spontaneously adopt, and that effects of the perspective manipulation are attributable primarily to processes occurring in the third-person condition.

Study 4

The main purpose of this study was to provide an experimental test of the motivation by perspective interaction observed in the previous study. The results of Study 3 were consistent with the hypothesis that third-person imagery reduces the impact of motivation on prediction. However, although visual perspective was manipulated, the relations observed between motivation and prediction involved correlations that may be attributable to effects of prediction on motivation or unidentified third-variables. To address these possible alternative interpretations, we experimentally varied the motivation to finish early as well as imagery perspective. According to our hypothesis, the effects of motivation on prediction will be reduced when participants adopt a third-person rather than a first-person perspective.

Method

Participants

Participants were 67 introductory psychology students (52 women, 15 men) compensated with course credit.

Procedure

Participants were recruited for a study examining how people think about future events, and participated in individual sessions. Participants were initially informed that they would be asked to visualize a future event and make some judgments about it. To manipulate visual perspective, participants were instructed to adopt either a first- or third-person perspective for the visualization procedure, and practiced adopting the assigned perspective as in Study 2. After the practice exercise, participants were asked to imagine a project completion scenario, in which their psychology professor had just given them a 15-page research essay that was due in 30 days. The scenario included a motivation manipulation: half of the participants were informed that, to encourage students to hand in the assignment promptly, the professor was offering one bonus mark for each day before the deadline the essay was submitted (high motivation condition) whereas the other participants were not informed of this incentive (low motivation condition). Note that this incentive structure targets specifically the motivation to finish the assignment early, rather than other possible motivations (e.g., to finish by the deadline or to submit high quality work). Previous work has shown that the motivation to finish a task early (i.e., well in advance of a deadline) contributes to underestimation of task completion times (e.g., Buehler et al., 1997). Participants were then asked to visualize, from the assigned perspective, the steps they would take to complete the assignment (e.g., collecting references, generating a thesis, typing the paper, editing and revising) as if they were actually carrying them out. After visualizing the assignment, participants were asked to predict when in the next 30 days the project would most likely be finished. As a manipulation check, participants rated the extent to which they had visualized the project from a first- vs. third-person perspective (0 = *totally first-person*, 5 = *combination*, 10 = *totally third-person*). In sum, the study used a scenario methodology to manipulate both the motivation to finish a project early (high motivation vs. low motivation) and imagery perspective (first-person vs. third-person) and then assessed predicted completion times.

Results and discussion

Manipulation check

A 2(perspective: first, third) × 2(motivation: high, low) ANOVA performed on the visual perspective ratings revealed only a main effect of perspective: Participants adopted the third-person perspective (relative to the first-person perspective) to a greater degree in the third-person condition ($M = 4.57$, $SD = 2.19$) than in the first-person condition ($M = 2.40$, $SD = 1.87$), $F(1,63) = 18.25$, $p < .001$.

Predicted completion time

Predicted completion times were submitted to a 2(perspective: first, third) × 2(motivation: high, low) ANOVA. A main effect of

motivation indicated that participants predicted they would take fewer days to finish the project in the high motivation condition (M = 21.63 days, SD = 5.89) than in the low motivation condition (M = 26.44 days, SD = 3.29), $F(1,63) = 20.45$, $p < .001$. A main effect of perspective indicated that participants predicted longer completion times when they adopted a third-person (M = 25.24 days, SD = 4.62) rather than a first-person perspective (M = 22.78 days, SD = 5.76), $F(1,63) = 4.59$, $p < .05$. More importantly, these effects were qualified by a significant perspective × motivation interaction, $F(1,63) = 4.99$, $p < .05$. Examination of the relevant means and contrasts (see Fig. 2) revealed considerable support for the attenuation hypothesis. Within the first-person condition, participants predicted they would finish earlier in the high motivation condition than in the low motivation condition, $t(63) = 4.56$, $p < .001$. Within the third-person condition, this effect of motivation was markedly weakened, $t(63) = 1.71$, $p = .08$.

The results provide further evidence that imagery perspective alters the role of motivation in prediction. When people imagined a task from the first-person perspective, their predictions were influenced by incentives to finish early. This pattern is consistent with previous evidence that predictions become more optimistic (and thus more prone to bias) when predictors are more motivated to finish promptly (Buehler et al., 1997; Byram, 1997). However, the influence of motivation on prediction was attenuated and virtually eliminated by third-person imagery. It appears that individuals are less inclined to base predictions on current motives when they envision tasks from a third-person rather than a first-person perspective.

General discussion

To predict when they will finish an upcoming task, people often create a mental simulation, or mental image of how it is likely to unfold (Buehler et al., 1994, 2002; Kahneman & Tversky, 1979; Taylor et al., 1998). We reasoned that a phenomenal characteristic of mental imagery – the visual perspective or vantage point that is adopted - could influence people's forecasts. The results of four studies were consistent with this proposal. More specifically, the findings supported each of three guiding hypotheses about the effects of imagery perspective. First, people predicted longer completion times – and thus were less prone to bias – when they imagined an upcoming task from a third-person rather than a first-person perspective. Second, the effect of imagery perspective was mediated by people's cognitive focus on plans vs. obstacles at the time of prediction: Third-person imagery reduced people's inclination to focus narrowly on optimistic plans, and increased their focus on potential obstacles. Third, imagery perspective altered the role of task-relevant motivation in prediction. The desire to finish an upcoming task promptly was reduced, and weighted less heavily, when individuals adopted a third-person rather than a first-person perspective. In essence, then, third-person imagery elicited predictions and underlying psychological processes that mimic those found previously in neutral observers (Buehler et al., 1994; Newby-Clark et al., 2000).

Fig. 2. Predicted days as a function of motivation and perspective (Study 4).

These findings expand our understanding of psychological processes underlying optimistic task completion predictions by providing converging evidence that a narrow focus on plans (as opposed to potential obstacles) is an important contributor to prediction bias (see also Buehler & Griffin, 2003; Buehler et al., 1994). The studies also identify a highly controllable factor that attenuates the optimistic bias in prediction. A handful of moderating factors have been identified already, including: characteristics of the task such as the amount of working time required to complete it (Roy & Christenfeld, 2008; Roy et al., 2005) and the extent to which it is prone to external interruption (Buehler, Peetz, & Griffin, 2010); individual differences in personality (Pezzo, Litman, & Pezzo, 2006); contextual factors such as whether the predictions are anonymous (Pezzo et al., 2006) and whether there are incentives for speedy completion (Buehler et al., 1997; Byram, 1997). The present studies extend this list and indicate that, holding constant each of the factors studied previously, people's predictions differ markedly depending on the vantage point they adopt when imagining an upcoming task.

The present research can be situated among a set of studies that suggest and test tools for "debiasing" task completion predictions. Strategies examined so far include providing forecasters with accurate information about previous completion times (Roy, Mitten, & Christenfeld, 2008), as well as prompting forecasters to recall and consider previous completion times (Buehler & Griffin, 2003; Buehler et al., 1994), to consider worst case scenarios or unexpected surprises (Byram, 1997; Newby-Clark et al., 2000), to consider the smaller constituent components of a task (i.e., task unpacking; Byram, 1997; Kruger & Evans, 2004), and to separately estimate and sum the time required for task components (i.e., task segmentation; Forsyth & Burt, 2008). Previous work on debiasing in this domain has yielded rather mixed and unencouraging results. The use of third-person imagery is a novel approach that shows considerable promise, and has a number of noteworthy advantages. Unlike approaches that rely on previous experience, it does not require that individuals have accurate knowledge about relevant previous tasks. Unlike approaches that involve the "segmentation" or "unpacking" of a task, it does not demand extensive sub-unit analysis or require that the target task can be broken down readily into identifiable segments, nor does it require additional cognitive effort. Finally, unlike strategies that alter the kinds of information people consider, the present strategy is not content specific, and thus can be applied generically to a wide range of target tasks and contexts.

When confirmed across a variety of task settings, the findings may have widespread practical implications for real world task completion forecasts. Imagery instructions similar to those used in our experiments could be applied in a range of settings in which practitioners (e.g., teachers, project managers, co-workers) wish to encourage others to generate realistic time estimates. A particular benefit of the imagery procedures is that they are relatively brief and easily administered. They appear to yield the advantages of predictions generated by thoughtful neutral observers without the need to consult with others or incur costly consulting fees.

Of course some caution is warranted in evaluating the potential benefits of the imagery perspective intervention. Although the intervention was effective when administered in controlled labora-

tory sessions, further work is needed to demonstrate that it can be effectively used in the midst of day-to-day activities. Also, although the intervention was shown to attenuate the optimistic bias in task completion predictions, the studies did not test whether this translates into positive downstream outcomes for individuals and organizations (e.g., improvements in scheduling, project management, efficiency and cost reduction). Are the changes in prediction produced by third-person imagery likely to have any lasting benefits? We believe that the benefits of accurate prediction, and costs of misprediction, will differ across contexts. Sometimes an unrealistic initial prediction is harmless. As long as individuals finish the task, and meet any external deadlines, it does not matter if they take longer than they initially thought. Moreover, as a task unfolds people are likely to revisit initial estimates, and might not adopt their original perspective. If subsequent forecasts differ from initial estimates, the impact of the initial forecasts may be limited. In some contexts, however, a prediction generated at the outset of a task can have serious and lasting consequences. This is most likely when people make decisions, plans, or binding commitments on the basis of the initial predictions. For example, individuals may rely on a task completion prediction to decide which projects, and how many projects, to tackle in the coming month. A tendency to underestimate completion times could result in overcommitment, stress, and aggravation. Also if initial predictions are expressed publicly they will have implications for others. A husband might make vacation plans based on a spouse's prediction of when she will finish her work. In collaborative work settings, individuals may plan work schedules around estimates offered by co-workers. Thus, to the extent that people make important plans, decisions, and commitments on the basis of their initial predictions, there are likely to be lasting costs of misprediction. It is in these contexts that third-person imagery may be of greatest value.

It is also noteworthy that third-person imagery reduced people's reported motivation to complete the target task promptly. Conceivably, this could introduce counteracting problems, such as decreased effort and persistence, and increased delays in task completion. We believe such effects will be minimal, however, at least relative to the effects of the intervention on prediction. This is because the task-relevant imagery that people generate to make predictions, and their corresponding motivation, are highly salient and accessible at the time of prediction, but will become less focal over time, as people encounter a multitude of other life events and competing demands. Indeed, previous research indicates that factors influencing motivation at the time of prediction are often momentary, and do not carry through to affect task performance over the long term (Buehler et al., 1997; Koehler & Poon, 2006). Nevertheless, in some contexts, any potential decrement in task performance, elicited by third-person imagery, may be unacceptable. Thus the decision to adopt third-person imagery should take into account not only potential benefits in terms of improved prediction, but also potential costs in terms of task performance.

Several other limitations of the present research also merit discussion. Participants were university undergraduates and the studies targeted tasks relevant to this group. It will be important to test the generalizability of the findings to more heterogeneous samples and a wider range of target tasks. It could be particularly valuable to know whether the findings apply to predictions concerning large-scale projects in industrial and organizational settings. We should also reiterate that our research was limited to predictions of when a task would be finished (i.e., task completion time) rather than predictions of the time spent working on the task itself (i.e., task duration). Given that these two types of predictions often diverge markedly (Buehler et al., 2010), it will be important to determine whether the present findings extend to predictions of task duration. There is reason to believe they may not. Previous work has found less optimistic bias – and thus less room for debiasing – in predictions of task duration than in predictions of task completion time (Buehler et al., 2010). Also, recall that research has revealed an actor–observer difference in predictions of task completion time (e.g., Buehler et al., 1994), but not in predictions of task duration (Byram, 1997; Hinds, 1999), and it is possible that studies of imagery perspective will yield a similar pattern.

Our findings apply primarily to cases where people use mental imagery or simulation to generate predictions, but the studies do not tell us how often this occurs. We believe it is a common approach. Research on behavioural prediction suggests that people frequently base self-relevant predictions on a mental image or simulation of how the target event will unfold (for a review see Dunning, 2007). For task completion predictions, in particular, it appears that people's natural inclination is to envision the specific steps they will take to complete the project successfully (Buehler et al., 1994, 2002; Kahneman & Tversky, 1979). This previous work suggests that people often make use of mental imagery to generate their task completion predictions. Nevertheless, a valuable direction for future research would be to identify factors (e.g., task characteristics, contextual factors, individual differences) that determine when people are less likely to generate predictions in this manner, as these could suggest boundary conditions for the effects of imagery perspective we have documented.

Another limitation is that the studies did not compare the imagery perspective intervention with other kinds of interventions. In particular, given the evidence that imagery perspective was mediated by an increased focus on obstacles, it might be argued that simply instructing people to focus on potential obstacles may be just as effective. However relevant research findings are mixed. Whereas some studies have found that people do predict longer completion times when they are prompted to focus on obstacles or problems (Peetz et al., 2009), several others report that predictions were not influenced by instructions to consider potential problems or surprises (Byram, 1997; Hinds, 1999) or to generate scenarios that differed from their initial plans (Newby-Clark et al., 2000). When people are directly confronted with potential obstacles and problems, they may be reluctant to incorporate this information into their predictions. Their desire to finish the task early may instead elicit a form of "motivated reasoning" (Kunda, 1990) wherein they dismiss the relevance of the undesirable information.

However third-person imagery could reduce this type of defensive reasoning, because obstacles are considered from a relatively detached, dispassionate perspective. Consistent with this proposal, actor–observer studies have found that instructions to generate pessimistic alternative scenarios did not affect actors' predictions concerning their own future tasks, but did result in longer predictions in neutral observers (Newby-Clark et al., 2000). This suggests that observers were less motivated than the actor participants to dismiss the negative scenarios they had generated. In a similar manner, we found that instructing participants to adopt third person imagery dampens the salience of their task motivation, and thus should make them more receptive to the possibility of obstacles. Thus there is reason to believe that the perspective intervention may have a greater impact than more direct instructions to focus on obstacles. These issues could be explored in future research that varies both the type of intervention (imagery perspective vs. focus on obstacles) and the predictors' motivation to complete a task promptly. It would also be informative in future work to compare predictions based on third-person imagery with those generated by neutral observers.

Moving beyond the realm of task completion predictions, our research contributes to an emerging literature examining the role of imagery perspective in various self-relevant appraisals (for a review see Libby & Eibach, 2009). As noted previously, a common

theme in this literature is that first-person imagery appears to elicit a focus on experiential information, whereas third-person imagery promotes greater reflective distance (e.g., Kross et al., 2005; Libby, Eibach, & Gilovich, 2005; Lorenz & Neisser, 1985; McIsaac & Eich, 2002; Pronin & Ross, 2006; Robinson & Swanson, 1993). Our evidence that third-person imagery decreased the salience and impact of task relevant motives is generally supportive of this view. Furthermore, whereas the bulk of previous research has examined imagery perspective for past events, we extend this idea to future imagery in a new and understudied judgmental domain. To our knowledge this is the first research to explore the impact of imagery perspective on the accuracy of behavioural prediction in general, or task completion predictions in particular. Additionally, our findings identify specific motivational and cognitive mechanisms underlying the effects of imagery perspective that have not been explored previously. Thus the present research enhances our understanding of the ways in which imagery perspective for future events can influence self-relevant judgment.

We do not wish to imply that third-person imagery will always yield realistic behavioral predictions, or attenuate the role of motivation in judgment. Indeed, recent research and theory suggests that third-person imagery can sometimes heighten people's motivation to pursue imagined future events (Libby et al., 2007; Vasquez & Buehler, 2007). Although third-person imagery may dampen people's experiential involvement with an event, it can have additional consequences. In particular, given that third-person imagery is a relatively distanced perspective, it can function like other forms of psychological distance (Liberman, Trope, & Stephan, 2007) and lead people to construe events in a relatively abstract manner (Libby et al., 2005). Such construals emphasize the broader meaning, significance, and personal relevance of an imagined event (Fujita, Trope, Liberman, & Levin-Sagi, 2006; Libby et al., 2005) and thereby enhance motivation. For example, Vasquez and Buehler (2007) found that students were more motivated to succeed on a future task when they visualized its successful completion from a third-person rather than a first-person perspective. Third-person imagery boosted motivation by prompting students to construe their success abstractly and perceive it as important. Thus it would appear that the psychological distance afforded by third-person imagery has potential to increase some motivationally driven phenomena and to attenuate others. A challenge for future research is to identify the conditions that determine which of these effects predominates. One possibility is that third-person imagery dampens motivation that is based on experiential processes (e.g., feeling states associated with the event) and increases motivation that is based on more deliberate, reflective processes (e.g., a consideration of the perceived importance, meaning, and significance of the event). This hypothesis awaits an empirical test.

Another avenue for future research is to explore in greater depth how and why third-person imagery reduces optimism in predictions. The present studies revealed cognitive and motivational mechanisms underlying the effects of visual perspective that were consistent with previous theory and research suggesting that third-person imagery can elicit processes that mimic those found in neutral observers (Frank & Gilovich, 1986; Kross et al., 2005; Robinson & Swanson, 1993). However additional research is needed to pinpoint more precisely how and why third-person imagery reduces the salience of task-relevant motivational states, and promotes a consideration of potential obstacles. It will also be valuable to explore further the role that visualization plays in the effects of imagery perspective. Although our manipulations heavily emphasized visualization (e.g., try to picture the upcoming task unfolding), images of future events are not necessarily visual in nature (e.g., Eardley & Pring, 2006). Future research should explore whether visualization is indeed an essential component of the perspective manipulation and determine whether other modes of perspective taking (e.g., first-person vs. third-person narration) elicit similar effects on behavioral prediction.

Finally, it remains to be seen whether effects obtained for task completion predictions generalize to other prediction domains. As noted previously, the optimistic bias and actor–observer differences found in predictions of task completion time characterize a variety of behavioral predictions (Dunning, 2007; Epley & Dunning, 2000, 2006; MacDonald & Ross, 1999; Vietri et al., 2009). Thus future research should determine whether third-person imagery can attenuate bias, and yield more realistic forecasts, for predictions concerning a wide range of future events and outcomes. Continued research along these lines will shed light on the complex interrelations between people's motives, mental images, and expectations for the future.

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