Focus on Outcomes or on Effort:
The Role of Self-efficacy on Influencing Expectations

Yong Kyu Lee

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Doctor of Philosophy
In
Business, Marketing

Paul Herr, Co-Chair
Rajesh Bagchi, Co-Chair
Kent Nakamoto
Amar Cheema

April 22, 2015
Blacksburg VA

Keywords: Goal-pursuit, Goal-setting, Self-efficacy, Expectations

Focus on Outcomes or on Effort:
The Role of Self-efficacy on Influencing Expectations

Yong Kyu Lee

ABSTRACT

In this dissertation, I investigate how differences in the manner via which individuals pursue goals (judging effort from outcome or outcome from effort) influences expectations (effort vs. outcome). In particular, I focus on the role of self-efficacy, and show that when individuals focus on outcomes, they take self-efficacy into consideration when assessing how much effort is needed. However, when focusing on effort, individuals do not take self-efficacy into consideration when making judgments of outcomes. Thus, I find that irrespective of differences in self-efficacy, individuals expect similar outcomes when effort invested is the same. I report findings from six studies, and discuss theoretical and managerial implications.

DEDICATION

To my wife – Jieun, and our adorable kids – Sieun, Siyoo and Sihyul

TABLE OF CONTENTS

Page

LIST OF FIGURES

Page

LIST OF TABLES

Page

CHAPTER 1 – GENERAL INTRODUCTION

A major focus of research on goals is to identify ways by which individuals and consumers can be encouraged to initiate and/or pursue goals. One individual difference variable that has been shown to influence goal-pursuit is self-efficacy. Self-efficacy refers to an individual's "ability to complete tasks and reach goals" (Locke and Latham 1990).

The idea of self-efficacy finds root in Bandura's social cognitive theory. This theory describes how efficacy influences the relationship between outcomes and effort (Bandura 1986, 1997); those with higher (vs. lower) efficacy expect more favorable outcomes. Likewise, those with higher (vs. lower) efficacy also expect to expend lower effort for achieving the same outcomes. These self-efficacy perceptions thus not only determine actions, but also effort devoted to a task (Bandura 1977, 1986, 1997).

I focus on how self-efficacy perceptions influence goal setting. I propose that the role self-efficacy plays in influencing one's "ability to complete tasks and reach goals" may depend on whether the focus is on trying to "complete tasks" or to "reach goals." I suggest that these two pursuits—task completion (studying for an exam or running) versus goal attainment (earning an A on the test or losing a certain amount of weight) are not the same, as the literature seems to suggest (Locke and Latham 1990). Indeed, goal contexts consist of two elements: the outcome from goal-attainment and the effort required to attain an outcome or a goal (i.e., ends and means; Skinner 1996). I propose the impact of self-efficacy differs depending on whether focus is on achieving outcomes or on completing a task.

More specifically, I argue that when two individuals wish to achieve the same outcome (e.g., to earn an A in a course or to lose 12 pounds), expected effort varies as a function of

individual differences in efficacy (e.g., GPA or ability to lose weight). This is consistent with arguments made in the self-efficacy literature (Bandura 1997). However, when two individuals exert identical effort (e.g., study for seven hours for an exam or run 12 miles/week on a treadmill), contradicting the literature on self-efficacy, I argue that both individuals will expect similar outcomes (i.e., an A or losing 12 pounds); in such instances, individual differences in self-efficacy will not affect expectations.

I argue this occurs because of differential attention to ability. In particular, when individuals focus on outcomes, and estimate effort required, individuals with higher efficacy are more likely to think about their ability relative to those with lower efficacy. In such situations, when estimating how much effort is required, expectations will differ as a function of self-efficacy. In contrast, when focus is on effort, individuals with both higher and lower efficacy are equally likely to think of their abilities. Because of this, the effect of self-efficacy will be attenuated. Therefore, outcome expectations will not differ as a function of efficacy. I also test and rule out other alternative explanations.

Because my focus is on understanding goal setting behaviors, I investigate how individuals make decisions based on expectations at goal *onset*. Indeed, it is well known that individuals spend a significant amount of time planning how to achieve important outcomes in their life as well as how to make effective use of their effort and time (Gollwitzer 1993, 1999). However, whether individuals focus on outcomes or on effort is likely to be influenced by both situational and individual difference variables. Indeed, research suggests that when planning, some individuals focus more on outcomes, while others focus on effort (Brunsø, Scholderer and Grunert 2004; Shah and Kruglanski 2003). I elaborate on this distinction more in the theoretical background section.

It may also be important to consider how decisions during goal onset influence actual behaviors. That is, what is the impact of these effort and outcome expectations on actual performance? While this is an important question, literature on efficacy often focuses on expectations (Bandura 1997; Bagozzi and Warshaw 1990), as these influence implementation plans. Consistent with this literature, I also focus on expectations. However, I do elaborate on how expectations may inform behaviors in the general discussion, and discuss implications for future research.

I study this phenomenon in six studies. In study 1, using a grade context, I show that when asked to focus on outcomes (e.g., trying to score 90% on a test), effort expectations vary with efficacy (GPA). Higher efficacy elicits lower effort expectations. In contrast, when focus is on exerting effort (e.g., studying seven hours for an exam), individuals expect the same grade irrespective of self-efficacy (GPA).

In study 2, I measure task-specific self-efficacy (based on performance in general knowledge tests). I then ask respondents to help us build a general knowledge database. Half the participants focused on outcomes (for a $200 payment, how many questions would they solve), while the rest focused on effort (to solve 1,000 questions, how much money would they want). I find that when focus is on outcomes (earning $200), self-efficacy influences effort expectations, but when focus is on effort (solving 1,000 questions), self-efficacy does not influence outcome expectations.

In study 3, I use a diet context to investigate these effects further. In order to test the robustness of the effects, I vary perceived level of task difficulty to be relatively high or relatively low. I demonstrate that when individuals focus on effort (e.g., number of miles run per week), self-efficacy does not influence participants' expectations of weight loss irrespective of

whether the effort is more difficult (run 24 miles per week) or less difficult (run 12 miles per week). Thus, participants expect the same outcomes even when the level of effort-difficulty is varied. However, when focus is on outcomes (e.g., losing weight), self-efficacy affects effort expectations in both the more difficult (2 pounds per week) as well as in the less difficult goal condition (1 pound per week).

In study 4, I use a weight loss context again. But, in this case, I use a different measure of efficacy – current weight. In this study, I don't ask participants to make judgments about their own weight loss. Instead, I present a scenario about another individual—Ben— trying to lose weight. I vary Ben's current weight (i.e., 186 vs. 228 pounds). I also vary whether this weight is made salient or not. As expected, when participants focus on outcomes (e.g., losing 2 pounds per week), they take Ben's current weight into consideration when it is made salient (vs. not). However, when participants focus on effort (e.g., exercising 8 hours per week), expectations of how much weight Ben would lose is not influenced by whether Ben's initial state (i.e., current weight) is made salient or not. Moreover, I show that difficulty perceptions meditate the effects of current state on effort expectations, but not on outcome expectations.

In study 5, I use a memory task. As in the earlier studies, I again measure task-specific self-efficacy, and show that when focus is on outcomes (memorizing a list of 15 words), self-efficacy influences effort expectations (time required to memorize these words). However, when focus is on effort (memorizing a list of words for 2 minutes), self-efficacy does not influence outcome expectations (how many words they can memorize). I also provide process support in this study. In particular, I show that thoughts about individuals' ability differ as a function of self-efficacy only when focus is on outcomes, and this mediates the effect of self-efficacy on effort expectations. I also rule out alternative explanations in this study.

In study 6, I use a marketing context to provide support for my thesis. I ask participants to solve mathematical problems. I manipulate self-efficacy by using a placebo product–that is, a chewing gum. Participants learn that this chewing gum either purportedly improves performance in skill tests (placebo condition) or improves oral health (control condition). I find that when focus is on outcomes (e.g., earning $100 by solving problems), self-efficacy influences effort expectations. However, when focus is on effort (e.g., solving 150 questions), self-efficacy does not influence outcome expectations. I discuss conceptual background next followed by my empirical investigation. I conclude with a discussion of the implications of this work.

CHAPTER 2 – THEORETICAL BACKGROUND

In order to understand how efficacy affects outcomes and effort, it is necessary to understand the relationship between these two constructs. The traditional literature generally refers to outcomes as goals and to effort as means to achieve these goals. These goals and means are generally categorized using a hierarchical framework, as described next.

Hierarchical Framework of Goals (Outcomes) and Means (Effort)

The system of goals and means consists of various hierarchical levels, such as goals (superordinate goals), sub-goals (focal goals), and means (subordinate goals; Austin and Vancouver 1996; Bagozzi and Dholakia 1999; Baumgartner and Pieters 2008; Bettman 1979; Kruglanski et al. 2002). Shah and Kruglanski (2003, 1109) define means as "any activity, event, or circumstance perceived as likely to contribute to the attainment of a goal." These means also reflect the amount of effort required to attain goals (Skinner 1996; Skinner, Chapman and Baltes 1998; Skinner, Wellborn and Connell 1990).

Individual goal-driven behaviors can also be divided into two stages – the goal setting stage and the goal striving stage. In the goal setting stage, individuals set a goal (i.e., superordinate goal), or form intentions. These intentions could be related to the goal (e.g., goal specific acts or outcomes) or to implementation plans (e.g., plans that specify the when, where and how of goal implementation in advance; Gollwitzer 1993, 1999). In the goal striving stage, individuals choose specific means to attain their goal and monitor goal progress. My focus is on the goal-setting stage, where individuals either set goals or form implementation plans.

Although most research focuses on understanding the effects of means associated with a currently specified goal (e.g., top-down process; Brunsø, Scholderer and Grunert 2004; Shah and Kruglanski 2003), some research suggests that the reverse route is also possible. That is, means can influence goal setting (bottom-up approach). For instance, when goals are not specified, a goal can be judged based on the means (effort) used to achieve it (e.g., bottom-up process; Brunsø, Scholderer and Grunert 2004; Shah and Kruglanski 2003). That is, the end state (outcome) can be determined based on the means available to reach this state (Bagozzi and Dholakia 1999; Skinner 1996). Furthermore, Frese, Stewart and Hannover (1987) suggest that individuals differ in how they approach goals; some are goal-oriented (focus on attaining outcomes), while others like to plan (specify plans and use this to make outcome inferences).

Taken together, literature suggests that both routes—from goals to means (top-down) as well as from means to goals (bottom-up)—are possible. Thus, individuals may use outcomes (goals) to judge effort required, as well as use means or effort to assess outcome expectations. Because my focus is on understanding how individuals make decisions during the goal setting stage, I am interested in investigating the role that self-efficacy plays when judging effort from outcomes or when judging outcomes from effort at goal onset. I discuss this next.

Self-Efficacy and its Relationship with Goals (Outcome) and Means (Effort)

In goal contexts, self-efficacy is perhaps the most important individual difference variable. Bandura (1986, 391) defines self-efficacy as "People's judgments of their capabilities to organize and execute [a] course of action required to attain designated types of performances."

He argues that perceived self-efficacy influences choice of activities, amount of effort invested, persistence, as well as goal-attainment expectations (Bandura 1977; 1982).

Indeed, individuals with higher (vs. lower) perceived self-efficacy are more successful and persistent (Bandura 1982; Stajkovic and Luthans 1998). These effects are robust and have been replicated in multiple contexts including those relating to academic achievement, acquisition of social skills, athletic contests, career pursuit, sales performance, and in even pain management contexts (Bandura 1986; 1997). However, self-efficacy has been generally shown to be context specific; greater self-efficacy in one context does not always lead to better performance in a different domain (Bandura 1993).

Self-efficacy theory suggests that there are four routes via which efficacy perceptions can be influenced (Bandura 1995; 1997). These are: mastery experience, vicarious experience, persuasion, and psychological state. Mastery experience refers to the role that past experience plays in influencing self-efficacy, and is perhaps the most influential route via which efficacy is influenced; that is, past success increases self-efficacy, while failure decreases lowers self-efficacy. With repeated success, self-efficacy beliefs become even stronger. When beliefs are stronger, occasional failures are less likely to impact self-efficacy beliefs; thus, past performance is one way via which self-efficacy beliefs can be influenced.

Vicarious experience—that is, observing others' performance—can also influence self-efficacy perceptions; that is, when an individual observes other people performing a certain task successfully, it has an impact on their own beliefs; that is, "if others can do it, so can I." Another route via which self-efficacy is influenced is through persuasion. For instance, mentors (e.g., teachers, coaches) often encourage mentees (e.g., students, athletes) by telling them that they possess the ability (or capabilities) to perform a particular task; such kinds of persuasion can

indeed increase effort and persistence, and has a positive impact on self-efficacy beliefs (Bandura and Cervone 1983; Fishbach, Eyal and Finkelstein 2010; Martocchio and Webster 1992). Finally, current psychological state has also been shown to impact self-efficacy beliefs (Bandura 1997). For example, fatigue or pain lowers psychological as well as physical efficacy, and has a detrimental impact on performance.

While there are at least four routes via which self-efficacy beliefs can be influenced, there are also multiple ways via which self-efficacy can be measured. Indeed, as mastery experience—that is, past experiences—can influence self-efficacy beliefs, past performances can be used as a measure of self-efficacy. Thus, when history of past performance is available, it is often used as an indicator of efficacy. For instance, in contexts relating to academic performance, GPA or performance in standardized tests can be used to measure efficacy (e.g., Elias and Loomis 2000; Hsieh, Sullivan, and Guerra 2007). In other instances, scales measuring task-related self-efficacy are administered. For instance, one approach to evaluate a participant's ability to solve general knowledge questions is to present the individual with a mini test comprising of a sample of general knowledge questions, and then provide feedback—that is, let participants know how they did on this test. Post-feedback self-efficacy perceptions are measured, and used as a determinant of self-efficacy (Fishbach, Eyal, and Finkelstein 2010; Smith, Kass, Rotunda and Schneider 2006). Efficacy perceptions can also be manipulated. For instance, providing a placebo (vs. not) can influence efficacy beliefs positively (Bandura 1997; Shiv, Carmon and Ariely 2005a, 2005b).

In order to demonstrate the robustness of my findings, and to also generalize my findings, I use different approaches to measure task-specific self-efficacy. When past performance-related data are available—for example, GPA in academic contexts—I use these (e.g., in study 1). In some of my other studies, I measure self-efficacy directly, by adapting prior established efficacy

scales (e.g., in study 3; Chen, Gully and Eden 2001). In one of my other studies, I use an individual's current state as a measure of self-efficacy (study 4). As Bandura (1997) contends, an individual's current physical and psychological state can also be a measure of self-efficacy.

In one of my other studies, I administer a domain related mini test first, and measure efficacy based on both actual performance, as well as perceptions of performance (study 2). For example, when measuring general knowledge self-efficacy, I provide participants with a general knowledge test—and provide performance feedback (i.e., how they performed). I, then, measure efficacy perceptions (post feed-back) using self-efficacy scales adapted from Smith et al. (2006).

I use this approach in several of my studies using different contexts, such as those relating to performance in memory tasks (study 5) and problem solving study (study 6). This approach provides a very conservative test of my theory; given that self-efficacy is measured just prior to the elicitation of expectations, one might expect these beliefs to be more salient, and thus, to affect responses. However, given the pattern of results I observe, it is fairly evident that even with such conservative procedures, self-efficacy affects expectations consistent with my predictions. In one of my studies (study 6), I also manipulate self-efficacy. Indeed, past research suggests that self-efficacy perceptions can also be manipulated. That is, external cues which can induce placebo effects are likely to temporarily enhance self-efficacy (Shiv, Carmon and Ariely 2005a, 2005b). This is consistent with Bandura's (1997) argument such that placebo effects also work through efficacy. These studies thus demonstrate the robustness of my findings. I develop my hypotheses next.

CHAPTER 3 – PURPOSE AND OUTLINE

Hypotheses Development

As discussed earlier, research suggests that individuals use two routes to attain goals (specify outcomes first and assess effort expectations or specify effort first and then assess outcome expectations). Research also suggests that self-efficacy should impact expectations irrespective of the route used. Indeed, Bandura (2006) suggests that perceived efficacy influences not only the goals individuals set, but it also affects the amount of effort individuals expect to exert as well as the outcomes they expect their efforts to produce.

I primarily argue that self-efficacy has an asymmetric impact on effort and outcome expectations. When outcome expectations are set first, I expect self-efficacy to influence effort expectations. Although one might expect that individuals with higher (vs. lower) efficacy will believe they need to expend lower effort for achieving similar outcomes (Salomon 1984), in some contexts a reversal may also emerge. That is, individuals with higher (vs. lower) efficacy may expect to spend more effort. For instance, Bandura (1982, 123) suggests that "when beset with difficulties people who entertain serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenges (Bandura and Schunk 1981; Brown and Inouye 1978; Schunk 1981; Weinberg, Gould, and Jackson 1979). High perseverance usually produces high performance attainments." Thus, regardless of the relative valence of expected effort (higher or lower), I expect differences in effort expectations contingent on efficacy when individuals focus on

outcomes. In contrast, when effort is predetermined, I do not expect self-efficacy to influence outcome expectations.

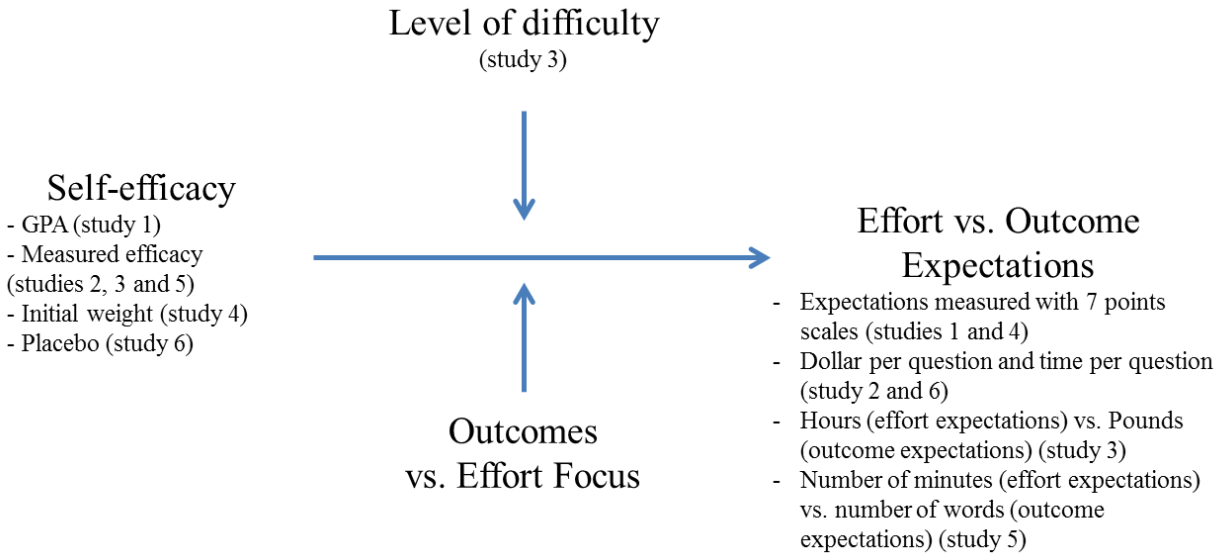
I argue this occurs because of differential focus on ability. In particular, consistent with self-efficacy theory, when outcomes are pre-determined, individuals will form effort expectations based on their individual ability. While in some contexts, higher (vs. lower) self-efficacy will lead to lower effort expectations, it will elicit higher expectations in other contexts. Thus, effort expectations will differ as a function of self-efficacy.

However, I argue that self-efficacy will not affect outcome expectations when individuals decide on effort first and assess outcomes based on this (e.g., when judging amount of weight loss after setting specific exercise plans [e.g., working out for an hour everyday]). In such situations, the effort is already predetermined, and individuals do not need to make changes to this plan or adjust their level of effort itself. Furthermore, because the effort is pre-specified, individuals assume they will be able to exert the required level of effort, irrespective of whether or not they have the ability to do so, and will judge outcomes based on this effort. Because of this, both high and low efficacious individuals will be equally likely to think of their ability; thus, efficacy's impact will be limited on goal pursuit. Even when the nature of the task is varied (e.g., difficulty level), individuals will still expect similar outcomes for the same amount of effort regardless of the level of self-efficacy. Therefore, regardless of high or low self-efficacy, individuals who expect to expend the same amount of effort will have similar outcome expectations. This prediction is inconsistent with what self-efficacy literature predicts: the relation between self-efficacy and future performance is significant and positive (Locke and Latham 1990) and that efficacy beliefs should influence the outcomes individuals expect their efforts to produce in social, intellectual, and physical pursuits; that is, highly efficacious people

expect more favorable outcomes (Bandura 1986, 1997, 2006). I study this phenomenon in six studies (Figure 1). These studies are discussed next.

Figure 1

Focus and Expectations: Role of Self-efficacy



CHAPTER 4 – THE EFFECT OF SELF-EFFICACY ON EXPECTATIONS: INVESTIGATING THE MODERATING ROLE OF FOCUS

STUDY 1: COLLEGE STUDY

Participants, Method, and Design

One hundred twenty-six undergraduates participated in this study for course credit. Six participants did not complete the survey, and therefore, their responses were excluded. The analyses reported use the remaining 120 responses (M_{age} = 21 years, 63% female).

Participants were asked to imagine that they had enrolled in a required class. On the first day of class the professor had discussed the grading scale and indicated what students would need to do to earn a particular grade (e.g., score 90% or more to earn an A, 80-89.9% to earn a B, and so on). They were then informed that they had their first exam a few weeks back. Focus was manipulated by informing participants how well they did on this test (outcome-focus) or how much effort they put in (effort-focus). In the outcome-focus condition, participants learned that they had scored 80% on the first test, whereas in the effort-focus condition, they had studied for five hours in total for this first test (a pretest indicated that participants expect to score 80% after studying for five hours). They were then told in the outcome-focus (effort-focus) condition that they wanted to score 90% on the second test (study for seven hours in total for the second test). A pretest had indicated that, to score 90%, participants expected to study for about seven hours.

Thus, I manipulated focus at two levels (outcome vs. effort) between subjects. Participants were asked to indicate effort expectations in the outcome-focus condition (e.g.,

"How much effort do you have to exert to reach your desired second exam score?" 1= not much at all, 7 = a lot), and outcome expectations in the effort-focus condition ("How well will you do on the second exam if you stick to your study schedule?" 1 = not well at all, 7 = very well). These measures served as my main dependent variables. Participants were also asked to indicate their overall GPA. This GPA served as a measure of self-efficacy.

Results and Discussion

Participants' expectations of how much effort it would take to earn a 90% grade on the second exam (in the outcome-focus condition) and how well they would perform on the exam (in the effort-focus condition) served as my main dependent measures. I regressed the dependent variable (expectations) on the independent variable (focus) and my measure of efficacy (mean-centered GPA). It may be important to note that although mean centering does not affect the test of an interaction, it allows one to make more meaningful interpretation of regression coefficients within the range of data (Hayes, Glynn, and Huge 2012).

A significant main effect of efficacy (GPA) (β = -.86 $t(116)$ = -2.27, $p < .03$) and a marginally significant effect of focus emerged (β = -.36 $t(116)$ = -1.87, $p = .06$). Given that the dependent variable varies on valence (outcome-focus: effort required lowers as efficacy (GPA) increases; effort-focus: grade expectations increase as efficacy (GPA) increases), the main effects of efficacy and focus cannot be meaningfully interpreted. However, my main thesis relates to the interaction. As expected, the predicted interaction between efficacy and focus emerged (β = 1.12 $t(116)$ = 2.12, $p < .04$).

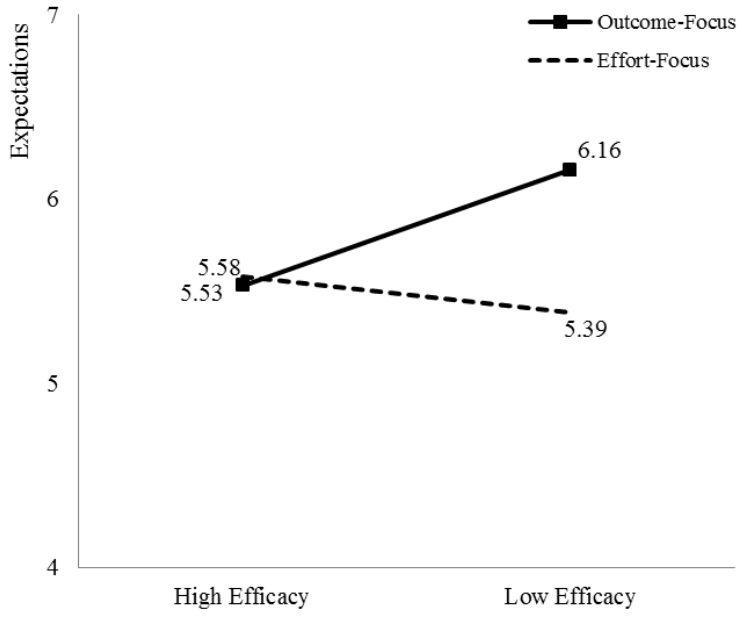
To probe the nature of this interaction further, a spotlight analysis was conducted. GPA was calculated at one standard deviation above and below the mean, and I computed how

expectations differed as a function of focus. As shown in figure 2, in the outcome-focus condition, expectations of effort required to score 90% on the exam differed as a function of efficacy; participants with lower efficacy felt they would have to expend more effort (M_{low} = 6.16 vs. M_{high} = 5.53; β = -.86 t = -2.27, p < .03). In contrast, in the effort-focus condition, outcome expectations did not differ as a function of efficacy (M_{low} = 5.39 vs. M_{high} = 5.58; β = .26 t = .71, p > .45).

I also conducted independent regressions separately in the outcome-focus and effort-focus conditions with effort expectations and outcome expectations as the dependent variables, respectively. The results were consistent with the results of the single combined regression; specifically, while effort expectations differed as a function of efficacy in the outcome-focus condition (β = -.86 t(59) = -2.28, p < .03), outcome expectations did not differ as function of efficacy in the effort focus condition (β = .26 t(57) = .71, p > .45).

Figure 2

Study 1: Effort (Outcome) Expectations in Outcome (Effort) focus Condition



Discussion. These results fully support my predictions. In the outcome-focus condition, efficacy (GPA) influenced effort expectations; specifically, participants with lower (vs. higher) efficacy expected it would take more effort to reach their goal. However, in the effort-focus condition, efficacy did not influence outcome expectations; that is, irrespective of individual differences in self-efficacy, all participants expected to do as well on the second exam if they studied for seven hours.

In academic contexts, GPA has been used to measure self-efficacy in the past, and has also been shown to be highly correlated with self-efficacy perceptions (Elias and Loomis 2000; Hsieh et al. 2007). Thus, in this study, I was able to use a real measure of self-efficacy in a context that students encounter often, and find support for my predictions. In study 2, I use a different approach; in this study, I use a "general knowledge test" context to provide support for my predictions. Participants first engage in a general knowledge test where they are asked to answer 10 general knowledge questions. I provide performance feedback—that is, indicate to participants how many questions they answered correctly. I then ask them to respond to several questions that measure their general knowledge self-efficacy. I then manipulate focus. In the outcome-focus condition, participants are asked to indicate how many questions they will be willing to solve (for a similar task) if it paid them $200. In the effort-focus condition, I ask participants to indicate how much money they would want for solving a fixed number of questions (1,000 questions). Thus, in this study, while the effort specifications (i.e., 1,000 questions) I use to manipulate effort focus is consistent with approaches used in my other studies, I use external rewards (i.e., $200 incentive) to manipulate outcome focus. Such kinds of rewards can indeed be used, as I discuss next.

According to social cognitive theory (Bandura 1997), external rewards (e.g., incentives) can indeed be used to manipulate outcome focus. Bandura suggests that outcome expectations are of three kinds: physical (e.g., physical pleasures), social (e.g., incentives), and self-evaluative effects (e.g., self-satisfaction). For example, the grade obtained in a class (as in study 1) is a direct measure of performance; however, the consequence of this performance–in this case, benefits from learning–can also be an outcome. This theory further suggests that performance and outcomes are indeed related, and can therefore be interchanged. In particular, "in activities where outcomes are highly contingent on quality of performance, the types of outcomes people anticipate depend largely on how well they believe they will be able to perform in given situations" (Bandura 1997, 23). Thus, even though payments based on performance (such as $200 in study 2 or $100 in study 6) are one level separated from a performance outcome, according to Bandura, these are also goals that are directly related to performance, and hence should have the same effects as other outcomes. This is because these external rewards are a direct consequence of performance expectations (as the reward is received contingent on producing a certain level of performance); hence, they can be considered as being outcomes. Thus, in this study, I investigate if my hypotheses about differential effects of self-efficacy on effort and outcome expectations extend to such kinds of outcomes. Consistent with study 1 findings, I expect self-efficacy to affect assessments when focus is on outcomes, but not on effort.

STUDY 2: GENERAL KNOWLEDGE TEST

Participants, Method, and Design

Two hundred and two adult participants (M_{age} = 31 years, 39% female) from an online panel took part in this study in return for nominal payment. Participants learned they would be taking part in a study assessing their general knowledge.

After a practice task, participants answered 10 general knowledge questions (a mix of true/false and multiple choice questions) without the use of an outside aid. I evaluated their performance—that is, the percentage of correct answers–and informed them of this. I then measured participants' general-knowledge-specific self-efficacy by asking them to respond to the following three questions: "How good are you at answering general knowledge questions" (1 = not good at all, 7 = very good), "How well can you perform on other such general knowledge tests" (1 = not well at all, 7 = very well), and "How good are you at identifying correct answers for such kinds of questions" (1=not good at all, 7 = very good). These three measures were averaged to form a composite score reflecting participants' perceptions of their general knowledge self-efficacy (α = .95). We also compared these perceptions with actual performance on the test (i.e., the number of correct answers). As expected, the measure of self-efficacy was indeed correlated with actual performance (r = .62, p <.0001), and my effects replicate with this measure of self-efficacy as well.

After measuring self-efficacy, I informed participants that we were planning to build a database of general knowledge questions that would help us test general knowledge of adults. Participants were further told that we already have a large database of general knowledge

questions (similar to the ones the participants responded to), and that we would like them to find correct answers for these questions. We would be offering payments for this, and wanted to ask participants a few questions pertaining to this.

I also manipulated focus (outcome or effort). In the outcome-focus condition, participants were told that we would be offering US $200 and asked them to indicate the total number of questions they would be willing to solve. In the effort-focus condition, participants were informed that the task would entail solving 1,000 questions. They were asked to indicate the total amount of money they would want to receive in return. A pretest had indicated that $200 was a reasonable payment for 1,000 questions. In both conditions, they were also asked to indicate how much time (in hours) they would be willing to spend on this task (open ended).

Because participants indicated the number of questions in the outcome-focus condition, but amount of money (in dollars) in the effort-focus condition, I created two composite variables to allow me to compare across these conditions–amount desired per question and a proxy for effort—that is, time taken to answer each question. To compute the amount desired per question, I divided $200 by the number of questions participants entered in the outcome-focus condition; in the effort-focus condition, I divided the amount of money desired by 1,000 questions. Similarly, to calculate effort per question (i.e., time taken to answer each question), I divided time (in hours) by the number of questions participants entered in the outcome-focus condition; in the effort-focus condition, I divided time (in hours) that participants indicated by 1,000 questions. These measures served as my main dependent variables, as they both provided a measure of effort (outcome) expectations.

Thus, I manipulated focus at two levels: 2 focus (outcome-focus vs. effort-focus) between subjects, and measured self-efficacy. Given that self-efficacy perceptions were solicited just

prior to the main task, when responding to main dependent measures self-efficacy should be equally salient for all individuals. Thus, this is a very conservative study, and finding effects in such a context will indeed attest to the robustness of my predictions.

Results and Discussion

Control variables. Because individual differences (e.g., age and gender) may affect participants' responses to general knowledge questions, these variables were initially controlled for in the analyses. However, they did not affect the results, and did not change the pattern of effects, and the effects replicate even when these variables are controlled for. Therefore, I did not consider them further in my analyses.

Effort (Outcome) Expectations. A regression of amount of money desired per question on focus (manipulated), self-reported measure of self-efficacy (measured and mean-centered) and their interaction revealed significant main effects of focus (β = -1.67 $t(198)$ = -3.20, $p < .02$), and self-efficacy (β = -.91 $t(198)$ = -3.27, $p < .02$). Participants in the outcome-focus condition expected a higher payment amount per question than those in the effort-focus condition; furthermore, interestingly, participants with higher efficacy expected a *lower* amount per question than those with lower efficacy. These main effects were qualified by the predicted interaction (β = .90 $t(198)$ = 2.01, $p < .05$).

To explore the nature of this interaction, the effects of self-efficacy on amount per question were examined in both the outcome-focus and the effort-focus conditions. A spotlight analysis was performed at one standard deviation above and below the mean of efficacy

(Fitzsimons 2008; Hayes 2012). Consistent with my predictions, in the outcome-focus condition, amount desired per question was greater when self-efficacy was lower relative to when it was higher ($M_{\text{low efficacy}}$ = \$2.85 vs. $M_{\text{high efficacy}}$ = \$0.67; β = -.91 t = -3.27, $p < .02$; see figure 3A). However, in the effort-focus condition, amount desired per question was not influenced by self-efficacy ($M_{\text{low efficacy}}$ = \$.11 vs. $M_{\text{high efficacy}}$ = \$.08; β = -.01 t = -.03, $p > .90$).[1]

A similar regression with time per question as the dependent variable also elicited significant main effects of focus (β = -105.36 $t(198)$ = -2.88, $p < .005$) and self-efficacy (β = -70.65 $t(198)$ = -3.60, $p < .0005$); participants in the outcome-focus condition expected to take more time to solve each question relative to those in the effort-focus condition; moreover, participants with higher efficacy expected to solve questions faster than those with lower efficacy. These main effects were qualified by the predicted interaction (β = 65.05 $t(198)$ = 2.06, $p < .05$).

The effects of self-efficacy on time per question were examined in both the outcome-focus and effort-focus condition by using a spotlight analysis. As expected, in the outcome-focus condition, effort required (time per question) was greater when self-efficacy was lower relative to when it was higher ($M_{\text{low efficacy}}$ = 217.99 sec vs. $M_{\text{high efficacy}}$ = 49.12 sec; β = -70.65 t = -3.60, $p < .0005$; see figure 3B). However, in the effort-focus condition, effort required was not influenced by self-efficacy ($M_{\text{low efficacy}}$ = 34.88 sec vs. $M_{\text{high efficacy}}$ = 21.51 sec; β = -5.60 t = -.23, $p > .80$). This suggests that in the outcome- focus condition participants paid attention to

[1] I also ran additional analyses. I log-transformed amount desired per question and subjected it to a regression with focus, self-efficacy and their interaction. Significant main effects of focus (β = -1.14 $t(198)$ = -12.28, $p < .0001$), and self-efficacy emerged (β = -.10 $t(198)$ = -2.09, $p < .04$). Even though these main effects were not qualified by the predicted interaction (β = .09 $t(198)$ = 1.09, $p > .20$), spotlight analysis showed that in the outcome-focus condition, amount desired per question was greater when self-efficacy was lower relative to when it was higher (β = -.10 t = -2.09, $p < .04$); however, in the effort-focus condition, amount desired per question was not influenced by self-efficacy (β = -.02 t = -.26, $p > .70$).

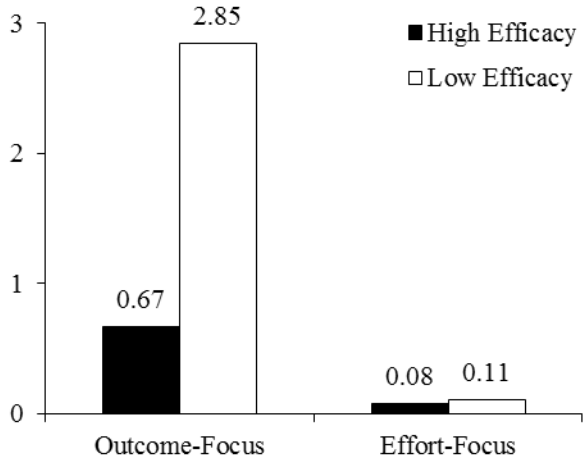
efficacy; that is, how much effort (i.e., time) it will take to answer each question. In contrast, I did not find any such effects in the effort-focus condition.[2]

I also replicated these analyses using the performance-based efficacy measures (i.e., the number of general knowledge questions correctly answered), and the effects replicate. These results are not reported for brevity's sake.

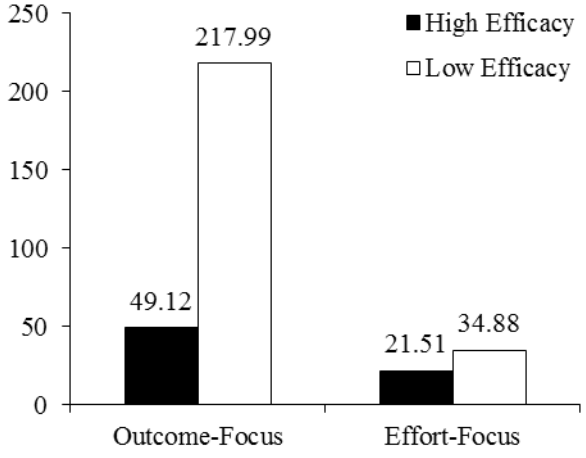
Figure 3

Study 2: Effort (Outcome) Expectations in Outcome (Effort) focus Condition

A. Amount per Question (in dollars)



B. Time per Question (in seconds)



Effort (Outcome) Expectations with untransformed measures. I also ran regression analyses in each focus condition separately. In the outcome-focus condition, I regressed the number of questions on self-efficacy, and the effects were not significant (outcome-focus

[2] A regression with a log-transformed measure of time per question as the dependent variable also elicited significant main effects of focus (β = -.59 t(198) = -8.37, p < .0001) and self-efficacy (β = -.10 t(198) = -2.67, p < .01). These main effects were qualified by the predicted interaction (β = .13 t(198) = 2.08, p < .05). As expected, spotlight analysis showed that in the outcome-focus condition, effort required (time per question) was greater when self-efficacy was lower relative to when it was higher (β = -.10 t = -2.67, p < .01); however, in the effort-focus condition, effort required was not influenced by self-efficacy (β = .03 t = .54, p > .50).

condition; β = 212.34 $t(100) = 1.47$, $p = .14$). A similar regression with amount of money on self-efficacy also did not elicit a significant main effect (effort-focus condition; β = -9.01 $t(98) = -.48$, $p = .64$). Nonetheless, as the results suggest, the effects were somewhat more marginal in the outcome-focus condition ($p = .14$), relative to that in the effort-focus condition, thus broadly supporting my conjecture.

I also subjected time indicated (i.e., the untransformed measure of time) to a regression analyses with focus and efficacy (mean-centered) as my independent variables. Only a marginally significant main effect of focus emerged (β = -2.92 $t(198) = -1.68$, $p = .09$); participants in the outcome-focus condition expected to spend more time to solve questions relative to those in the effort-focus condition ($M_{\text{outcome-focus}}$ = 10.75 hours vs. $M_{\text{effort-focus}}$ = 7.83 hours). However, none of the other effects were significant (main effect of efficacy: $\beta = .05$ $t(198) = .05$, $p > .90$; focus x efficacy interaction: β = -1.60 $t(198) = -1.07$, $p > .28$). It may be important to note that while both groups of participants expected to generally spend the same amount of time, their expectations of what they expected to achieve in this time was markedly different, as indicated by my analyses of the transformed time variable—time spent per question. This attests that individuals indeed reflect more on their ability—that is, self-efficacy—and what they can achieve during this time when focusing on the outcomes, but these effects are mitigated when their focus is on effort.

Mediation Analysis. A mediation analysis was conducted to investigate if time per question mediates the effects of self-efficacy and focus on amount desired per question. I tested for mediated moderation where the moderator affects an outcome variable through a mediator, and the indirect effect of the independent variables and moderator is estimated (see model 8;

Hayes 2012). For the mediation analysis, 5000 bootstrapped samples were used and bootstrap 95% confidence intervals for each level of focus (outcome vs. effort) were obtained. As expected, the indirect effect of self-efficacy and focus on amount per question through time per question was significant (95% CI: .0051 to 1.9804), suggesting support for mediated moderation.

Moreover, the significant indirect effect of self-efficacy on amount per question through time per question emerged only for individuals focusing on outcomes (indirect effect = -.80; 95% CI: -2.0520 to -.0811). However, the indirect effect of self-efficacy on amount per question through time per question was not significant in the effort-focus condition (indirect effect = -.06; CI: -.0327 to .1209).

Discussion. These results provide additional support for my predictions. Indeed, self-efficacy influences effort expectations (e.g., amount earned per question and time spent per question) when participants focus on outcomes (i.e., earning $200), but not when they focus on effort (i.e., solving 1,000 questions).

I also find process support for my findings. It appears that participants in the outcome-focus condition took effort into consideration when evaluating outcomes, as demonstrated by the significant mediation; indeed, effort (time) taken to solve questions was lower when efficacy was higher. Specifically, individuals with lower self-efficacy believed that they need to put much more effort to solve questions (217.99 seconds per question vs. 49.13 seconds per question), suggesting that they took their ability into consideration when responding. Consequently, they asked for a higher amount per question ($2.85 per question vs. $.67 per question). However, in the effort-focus condition, time taken to respond was not different.

In the first two studies I demonstrate that self-efficacy influences expectations only when individuals focus on outcomes but not when they focus on effort. I also provide process support in study 2. In studies 3 and 4, I investigate the robustness of these findings and provide more process support by varying task and goal difficulty. It is possible that self-efficacy did not influence participants' outcome expectations in the effort-focus condition because the effort required was not perceived to be very high. Research suggests that individuals with higher self-efficacy beliefs are more likely to select difficult tasks relative to those with lower self-efficacy. It is possible then that increasing the level of difficulty of effort may increase the relevance of self-efficacy (Bandura 1986). In contrast, my hypothesis suggests that individuals do not pay attention to task characteristics as much when effort is pre-determined. Consistent with study 2 findings, efficacy should not influence outcome expectations when focus is on effort regardless of whether task difficulty is high or low; in contrast, efficacy should influence effort expectations when focus is on outcomes regardless of task difficulty (relatively high vs. relatively low). I test this possibility in the next two studies.

STUDY 3: WEIGHT-LOSS STUDY

Participants, Method, and Design

One hundred and forty-two undergraduates completed this study for course credit. One participant's responses were irregular, and was excluded (all responses were one; including this

only strengthens findings). The analyses reported use the remaining 141 responses. (M_{age} = 21 years, 61% female).

This study used a 2 focus (goal vs. effort) x 2 difficulty (high vs. low) full factorial between-subjects design. Participants were asked to imagine that they had gained some weight recently and so had decided to try and get back in shape. Participants decided to enroll at a local gym to lose weight. In the outcome-focus condition, participants set up a specific goal for themselves; in the effort-focus condition, participants were told that they had set up a specific plan for themselves.

Difficulty was also manipulated between subjects. In the outcome-focus condition, participants were told that they planned to lose 12 pounds in total. In the low-difficulty goal condition, they were told that they planned to lose this weight over a 12 week period (i.e., 1 pound/week); in the high-difficulty condition, participants were told they planned to lose this weight in 6 weeks (i.e., 2 pounds/week). A pretest suggested running 12 (24) miles/week would lead to a reduction of 1 (2) pound(s)/week. Therefore, in the low-difficulty effort condition, participants were told that they plan to run 12 miles/week, whereas in the high-difficulty condition, they were informed that they plan to run 24 miles/week. In the outcome-focus (effort-focus) condition, participants were asked to indicate how many hours they would need to spend in the gym per week to achieve this goal (how many pounds they would lose per week following this plan). This was an open-ended question, so they entered their estimated expectations. These questions serve as my main dependent measures.

They were also asked to report their agreement on several exercise related self-efficacy questions. These scales were adapted from Chen et al. (2001); I rephrased some of the questions

to make them appropriate in an exercise context (see appendix). Finally, they indicated if they were currently trying to lose weight (yes, no), and their current weight.

Results and Discussion

If difficulty or lack of it in the earlier studies was the reason for efficacy effects emerging in the outcome-focus condition but not in the effort condition, then we would expect efficacy effects to emerge only in the difficult outcome/effort condition. However, my theory suggests that difficulty should not change the pattern of results. This is because when effort is pre-specified (as in the effort-focus condition), individuals are not likely to assess their own ability (self-efficacy) in achieving this task. Consequently, efficacy effects should be attenuated, and this should occur regardless of the level of difficulty.

Control variables. As in the earlier studies, I initially controlled for various variables in my analyses (e.g., age, gender, whether individuals are currently trying to lose weight or not). None of these variables were significant and they also did not change the pattern of results, and the effects replicate regardless. Therefore, I did not consider these variables further in my analyses.

Effort (Outcome) Expectations. It may be important to note that participants responded to two different questions in the two different conditions. In the outcome-focus condition, participants indicated how much time (in hours) they needed to spend in the gym every week to achieve their weight-loss goal, whereas, in the effort-focus condition, they indicated how many pounds they would lose per week if they followed the plan. Because two different measurements

were used (hours vs. pounds), we conducted separate analyses in the outcome-focus and effort-focus conditions, and regressed our dependent measures on difficulty (manipulated) and efficacy (mean-centered). It may be important to note that the pattern of effects replicate when I use a combined analyses. The separate analyses are reported next, using outcome-focus condition first, followed by effort-focus.

A regression of effort expectations (in hours) on difficulty, self-efficacy and their interaction revealed significant main effects of difficulty (β = -1.59 $t(68)$ = -2.17, $p < .04$) and efficacy (β = -.74 $t(68)$ = -1.89, $p = .06$). Participants expected to spend more time exercising when the goal was more difficult ($M_{\text{high difficulty}}$ = 7.86 hours vs. $M_{\text{low difficulty}}$ = 6.26 hours). Further, participants with higher efficacy expected to spend more time exercising ($M_{\text{high self-efficacy}}$ = 7.25 hours vs. $M_{\text{low self-efficacy}}$ = 6.88 hours). While these effects appear somewhat contradictory (that is, one might expect individuals with lower efficacy to take more time to lose weight), the effects appear to reveal domain knowledge differences—those who have more efficacy likely are more familiar with how much effort is require to attain weight loss goals, and therefore expected they would need to spend more time working out. Importantly, from my perspective, differences emerged between these two conditions, supporting my conjecture that efficacy will impact responses in the outcome-focus conditions. These main effects were qualified by a significant two-way interaction of difficulty and efficacy (β = 1.78 $t(68)$ = 2.81, $p < .007$).

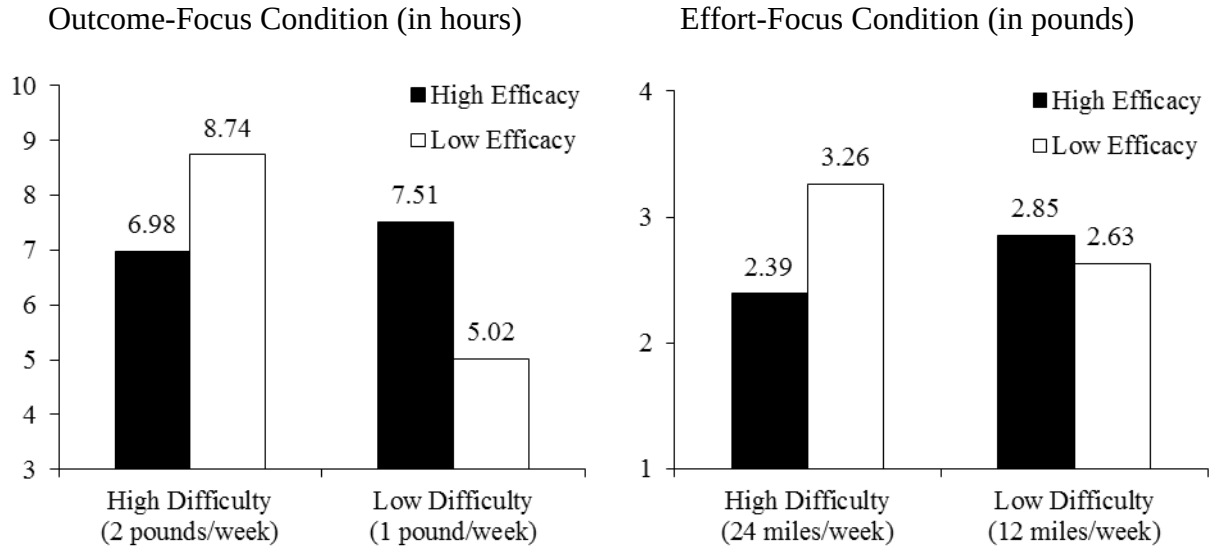
To probe the nature of the two-way interaction, I also conducted a spotlight analysis. As shown in figure 4, efficacy influenced assessments of effort expectations (in hours) in both the high difficulty ($M_{\text{high self-efficacy}}$ = 6.98 hours vs. $M_{\text{low self-efficacy}}$ = 8.74 hours; β = -.74 t = -1.89, p = .06) as well as in the low difficulty conditions ($M_{\text{high self-efficacy}}$ = 7.51 hours vs. $M_{\text{low self-efficacy}}$ = 5.02 hours; β = 1.04 t = 2.08, $p < .05$). The interaction also seems to suggest that efficacy

perceptions have differential effects on expectations and are contingent on task difficulty. When tasks are more difficult, those with higher efficacy expect to spend less time relative to those with lower efficacy, however, these effects are reversed when tasks are easier.

However, in the effort-focus conditions, a similar regression with outcome expectations (amount of weight loss) on difficulty, self-efficacy and their interaction did not reveal any significant effects (main effect of difficulty: β = -.08 $t(65)$ = -.18, p > .80; main effect of efficacy: β = -.37 $t(65)$ = -1.45, p > .15; difficulty x efficacy interaction: β = .46 $t(65)$ = 1.20, p > .20). In order to assess if there were differential effects as a function of difficulty, I also conducted a spotlight analysis (similar to the one conducted in the outcome-focus condition). As expected, efficacy did not affect outcome expectations (amount of weight loss) regardless of whether the task was difficult ($M_{\text{high self-efficacy}}$ = 2.39 pounds vs. $M_{\text{low self-efficacy}}$ = 3.26 pounds; β = -.37 t = -1.45, p > .15) or easy ($M_{\text{high self-efficacy}}$ = 2.85 pounds vs. $M_{\text{low self-efficacy}}$ = 2.63 pounds; β = .09 t = .33, p > .70).

Figure 4

Study 3: Effort (Outcome) Expectations in Outcome (Effort) focus Condition



Discussion. These results fully support my predictions. Self-efficacy influences effort expectations (i.e., time spent exercising) when participants focus on the outcome (i.e., losing weight), and this pattern replicates for both difficult and easy goals; however, self-efficacy does not affect outcome expectations (i.e., amount of weight loss) when participants focus on effort (i.e., running), and this effect also replicates for both levels of difficulty. These results also indicate that high efficacious participants' expectations in outcome-focus condition were relatively stable; that is, their expectations did not vary as a function of difficulty. This may have occurred because those with higher efficacy (vs. lower efficacy) may have relied more on their ability (i.e., internal information); on the other hand, those with lower efficacy may have focused more on the goal (external information).

In studies 1-3, I used contexts where individuals indicated effort (outcome) expectations at goal onset—that is, before commencing goal pursuit; in each of these cases, I consistently find that self-efficacy affects expectations when focus is on outcomes, but not on effort. While I kept the same end-state and measured efficacy separately in studies 1 and 2, I manipulated the desired end-state by varying the difficulty of the task in study 3. But goals also have an initial state, and usually relate to reaching an end state that is conditional on the initial state. In the next study, I investigate if my predictions would emerge in situations where the distance remains the same, but the initial (or current) state varies.

Indeed, research suggests that both the current as well as the desired end state affects goal pursuit. For instance, the goal-gradient effect shows that effort invested in reaching a goal increases as the distance between the current state and the final state decreases (Hull 1932; Kivetz, Urminsky, and Zheng 2006). While most research suggests that, during goal pursuit, the end state is used as a reference point, and effort is estimated based on how this end state relates

to where individuals are currently situated, recent research also demonstrates that the current state can also be used as a reference point. For instance, findings suggest that when individuals are far from their goal, they are more likely to focus on completed actions, and consequently, use the initial state as a reference point (Bonezzi, Brendl and De Angelis 2011; Koo and Fishbach 2012). This research also suggests that when individuals are closer to their goal, they are more likely to focus on remaining actions, because of which they are likely to use the end state as a reference point. Furthermore, a goal itself may also serve as reference point, and consequently influence the valuation of outcomes (Heath, Larrick and Wu 1999). This research further suggests that the amount of effort to obtain a goal may be differentially affected depending on which reference point is salient. Before initiation, goals are likely to have two possible reference points: one is the goal (i.e., end state), and the other, is the individual's current standing (i.e., starting point). In this study, I investigate if my predictions would replicate in contexts where the current state is made salient. Consider a situation where an individual is trying to lose 2 pounds; however, the individual's current weight is either 186 or 228 pounds. I argue that this current state (i.e., weight) can also influence self-efficacy perceptions, and may affect subsequent assessments.

In particular, when current weight is made salient, one of two thoughts might be activated in an observer's mind. On the one hand, an individual with a lower current weight (i.e., 186 pounds) may be more capable of losing 2 pounds, as they have a lower weight, and hence, are indeed better at maintaining this lower weight. This would lead to the inference that an individual with a lower (vs. higher) current weight is more efficacious at losing weight. However, a contrarian argument can also be proposed. Because it may be easier to lose 2 pounds when the starting point is higher (i.e., 228 pounds), one can argue that the individual with the higher (vs.

lower) weight may find it easier to lose weight, and may therefore, have higher weight-loss efficacy. Based on the first (second) perspective, current weight may be thought of as being negatively (positively) related to perceived self-efficacy; that is, an individual weighing 186 (228) pounds would find it easier to lose 2 pounds, and hence is more efficacious. I investigate this possibility in the next study. However, as I demonstrate, these effects only emerge when current weight is made salient. When current weight is not made salient, I do not expect any differences; this is because in this instance observers are only likely to focus on the goal of losing 2 pounds, and hence differences will not emerge.

In contrast, focusing on effort (e.g., exercising 8 hours per week) should elicit a pattern of results consistent with my earlier findings. That is, regardless of whether current weight is made salient or not, I expect observers to predict similar outcomes when focus is on effort, irrespective of the starting point.

Thus, the purpose of study 4 is two-fold. First, I demonstrate the robustness of my findings by using an individual's current state as a measure of self-efficacy. Consistent with study 1-3 findings, I expect efficacy to play a role when focus is on outcomes, but not on effort. Thus, participants should expect similar outcomes for similar amounts of effort even when starting points differ. I also provide process support by demonstrating the mediating role that difficulty perceptions play. Second, in this study, I show that these effects also occur when an individual is an observer.

STUDY 4: EXERCISE STUDY

Participants, Method, and Design

Two hundred and thirty-eight undergraduates completed this study for course credit (M_{age} = 21 years, 60% female). The scenario indicated that Ben had enrolled at a gym; his trainer prepares a plan to help him lose weight. Outcome-focus (effort-focus) was manipulated by stating that the trainer had set up a specific weight-loss goal (exercise routine). Information provided by the American College of Sports Medicine and the American Heart Association was used to manipulate weight goals and exercise routines so that they were equivalent. Specifically, participants were informed that the trainer wanted Ben to lose 2 pounds (exercise 8 hours) per week for a period of 4 weeks.

Participants were either informed that Ben's weight was 186 pounds or 228 pounds. While all participants were made aware of Ben's weight, in the current-state salient condition, I reminded participants again what Ben's current weight was before soliciting responses. That is, participants were told: "Remember Ben's current weight is 186 (228) pounds". In the current-state not-salient condition, participants were not reminded of Ben's current weight (and were only told "Ben's goal is to lose 2 pounds per week for a period of 4 weeks" or "Ben is scheduled to exercise 8 hours per week for a period of 4 weeks").

Thus, this study used a 2 initial weight (186 vs. 228) x 2 salience of current state (yes vs. no) x 2 focus (outcome-focus vs. effort-focus) full factorial between-subjects design. Participants were asked to indicate effort expectations in the outcome-focus condition ("How much effort does Ben have to put to reach his goal at the end of 4 weeks?" 1= not much at all, 7 = a lot), but

provide outcome expectations in the effort-focus condition ("How much weight will Ben lose at the end of 4 weeks?" 1 = not much at all, 7 = a lot). All participants also responded to a question assessing perceptions of difficulty ("How difficult will it be for Ben to achieve his goal? How difficult will it be for Ben to stick to his exercise schedule?" 1 = not difficult at all, 7 = very difficult; in the outcome-focus and effort-focus conditions, respectively). I measured difficulty as it provides another measure to assess an individual's perceived ability. If the effects that I observe occur because of differential attention to ability, I would expect perceptions of difficulty to be different when focus is directed on outcomes, but not on effort.

Results and Discussion

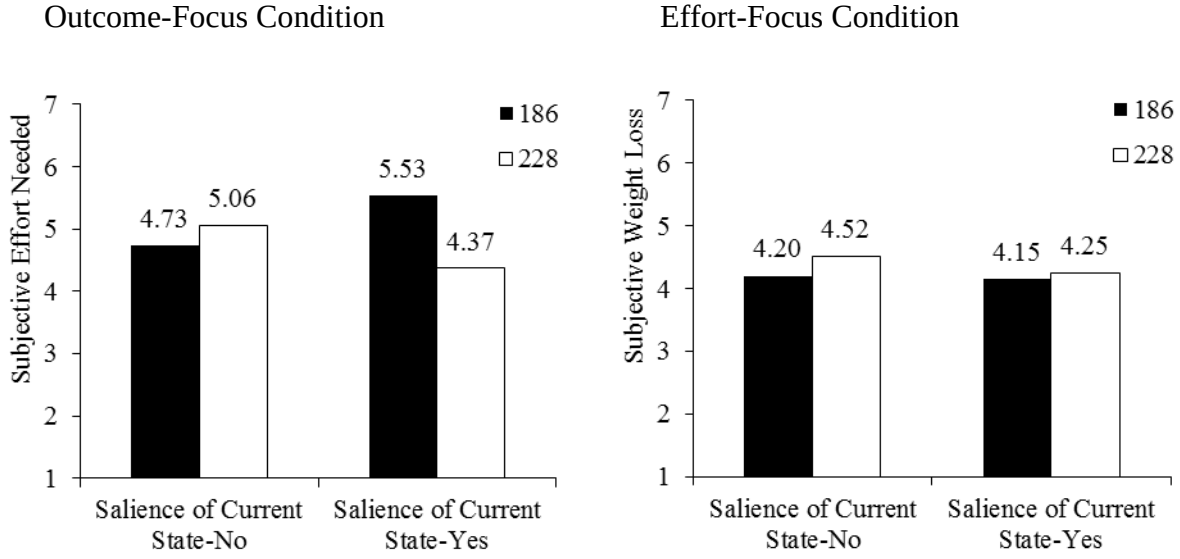
Effort (Outcome) Expectations. An ANOVA with effort (outcome) expectations as the dependent variable elicited a main effect of focus ($F(1,230) = 15.23$, $p < .0001$), a two-way interaction of focus and initial weight ($F(1,230) = 3.64$, $p = .06$), and a two-way interaction of salience of current state and initial weight ($F(1,230) = 6.74$, $p < .02$).

Expectations of participants in the outcome-focus condition varied as a function of initial weight ($M_{186} = 5.13$ vs. $M_{228} = 4.72$; $p = .07$); however, those in the effort-focus conditions expected similar outcomes, irrespective of whether Ben's initial weight was low or high ($M_{186} = 4.17$ vs. $M_{228} = 4.39$; $p > .30$). Moreover, when current state was not made salient, participants' expectations did not vary as a function of the initial weight ($M_{186} = 4.47$ vs. $M_{228} = 4.79$; $p > .10$); on the other hand, expectations were significantly different when current state was made salient ($M_{186} = 4.84$ vs. $M_{228} = 4.31$; $p < .02$).

As predicted, a three-way interaction of initial weight, current state, and focus also emerged ($F(1,230) = 3.75$, $p = .05$; see figure 5A). As expected, the initial weight x salience contrast interaction was significant in the outcome-focus condition ($F(1,230) = 10.71$, $p < .002$), but not in the effort-focused condition ($F(1,230) = .21$, $p > .64$). Specifically, in the outcome-focus condition (trying to lose weight), when current state was made salient, Ben was expected to spent greater effort to meet his goal when his initial weight was 186 pounds relative to when it was 228 pounds ($M_{186} = 5.53$ vs. $M_{228} = 4.37$; $p < .0005$); however, these differences did not persist when the current state was not made salient ($M_{186} = 4.73$ vs. $M_{228} = 5.06$; $p > .30$). In contrast, in the effort-focus condition, initial weight did not significantly affect outcome expectations irrespective of whether Ben's current state was made salient ($M_{186} = 4.15$ vs. $M_{288} = 4.25$; $p > .73$) or not ($M_{186} = 4.20$ vs. $M_{228} = 4.52$; $p > .37$).

Figure 5A

Study 4: Effort (Outcome) Expectations in Outcome (Effort) focus Condition

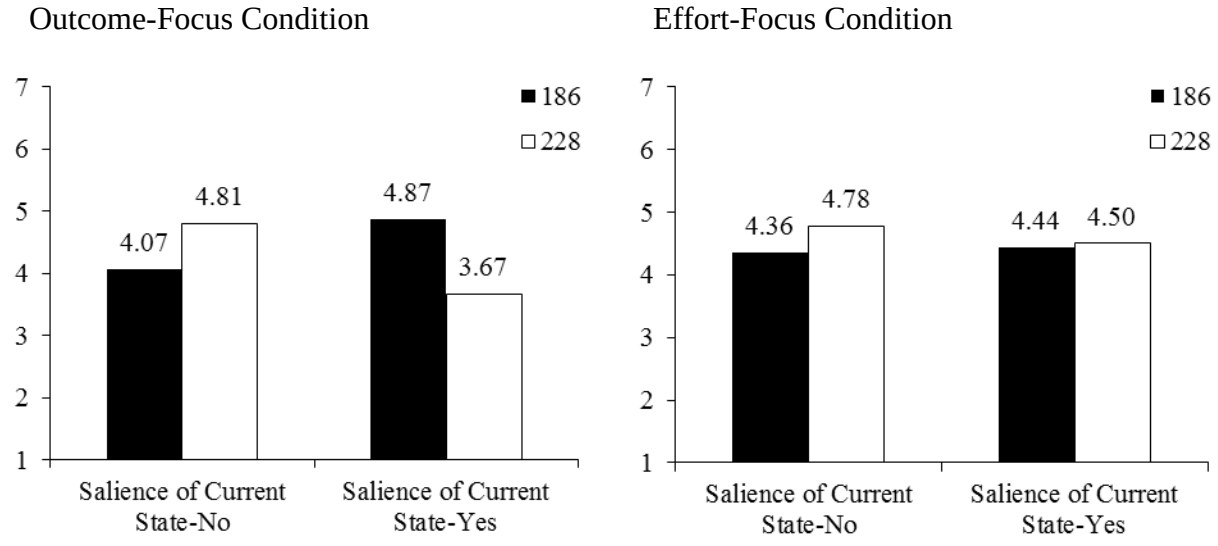


Difficulty Perceptions. An ANOVA with difficulty as the dependent variable revealed a significant two-way interaction of initial weight and current state ($F(1,230) = 10.63$, $p < .002$) and the predicted three-way interaction of initial weight, current state, and focus ($F(1,230) = 5.00$, $p < .03$; see figure 5B).

The initial weight x current state contrast interaction was significant in the outcome-focus condition ($F(1,230) = 15.74$, $p < .0001$), but not in the effort-focus condition ($F(1,230) = .50$, $p > .47$). Specifically, in the outcome-focus condition, when Ben's current state was made salient, the goal was judged as being more difficult when his initial weight was lower versus higher ($M_{186} = 4.87$ vs. $M_{228} = 3.67$; $p < .001$); on the other hand, when Ben's current state was not made salient, a lower initial weight elicited lower difficulty perceptions ($M_{186} = 4.07$ vs. $M_{228} = 4.81$; $p < .04$). However, in the effort-focus condition, Ben's initial weight did not affect difficulty perceptions irrespective of whether his current state was made salient ($M_{186} = 4.44$ vs. $M_{288} = 4.50$; $p > .85$) or not ($M_{186} = 4.36$ vs. $M_{228} = 4.78$; $p > .27$).

Figure 5B

Study 4: Difficulty Perceptions



Mediation Analysis. A mediation analysis was conducted to investigate if difficulty perceptions mediate the effects of initial weight, current state, and focus on effort (outcome) expectations. We tested for mediated moderation, where the moderator affects an outcome variable through a mediator, and estimated the indirect effect of the independent variables and the moderator (see model 12; Hayes 2012).

For the mediation analysis, 5000 bootstrapped samples were used and bootstrap 95% confidence intervals for each level of the moderator (the salience of current state and focus) were obtained. The indirect effect of initial weight, current state, and focus (outcome-focus vs. effort-focus) through difficulty was significant because the 95% bootstrap confidence interval did not include zero (CI: .0974 to 1.2395); thus, these findings indicate support for mediated moderation.

Furthermore, the significant indirect effect of initial weight on effort (outcome) expectations through difficulty emerged only when individuals focused on outcomes, and this occurred regardless of whether the current state was made salient or not (Table 1). A 95% bootstrap confidence interval for the two conditional indirect effects did not include zero (current state salient: -.8015 to -.1792; current state not salient: .0516 to .5190). However, when focus was on effort, I did not find any significant effects (current state salient: -.2097 to .2424; current state not salient: -.1582 to .4853).

TABLE 1

Study 4: Mediated Moderation – Moderator Current State and focus, Mediator Perceived Difficulty

		Conditional Direct effects				Conditional Indirect Effects	
						Perceived Difficulty	
		B	S.E.	*t*	*P*	*B*	95% C.I.
Effort/Outcome Expectations	Salience-No x Outcome-focus	.06	.30	.19	>.84	.27	.0516 to .5190
	Salience-Yes x Outcome-focus	-.72	.31	-2.36	<.02	-.44	-.8015 to -.1792
	Salience-No x Effort-focus	.17	.34	.49	>.62	-.16	-.1582 to .4853
	Salience-Yes x Effort-focus	.08	.28	.27	>.77	-.02	-.2097 to .2424

Discussion. The purpose of study 4 was to demonstrate that current state can also influence self-efficacy perceptions. In this study we used a different measure of self-efficacy. At the core, self-efficacy is an indicator of an individual's internal capabilities to achieve an outcome and/or to exert effort. Thus, available resources (e.g., time, effort) can also be a measure of self-efficacy. Because current status is one such resource, it can be used to infer self-efficacy. As my findings demonstrate, people do indeed make inferences based on an individual's current state. While I expected differences as a function of the initial state, I posited that two patterns of effects were possible. I expected current weight to either be negatively associated with perceived self-efficacy or to have a positive association. My findings suggest a positive association—that is, observers feel that a heavier individual would find it easier to lose 2 pounds relative to a lighter individual, and hence a heavier individual was judged to be more efficacious relative to a lighter individual.

Furthermore, and as predicted, I find that these effects were contingent on both salience of current state as well as focus. In particular, when current state was made salient, focusing on outcomes leads to differential pattern of results based on initial weight. However, these effects did not emerge when current state was not made salient. Thus, when current weight was made

salient, individuals focused on the current weight and used two pieces of information (the weight-loss goal and current weight) to judge others' effort expectations. They believed that a heavier individual would need to exert less effort relative to a lighter individual to lose weight, as it is indeed easier for heavier individuals to lose weight. However, when current weight was not made salient, observers appeared to have only focused on the weight-loss goal and used this information to judge how much effort was needed. Consequently, effort expectations did not differ as a function of the individual's initial weight.

In contrast, focusing on effort led observers to only use the stated effort, and they seemed to have ignored information about the individual's current weight. Thus, in this case, irrespective of whether Ben's current state was made salient or not, outcome inferences were not influenced by his initial weight.

Moreover, as expected, difficulty perceptions mediated these effects. Consistent with my earlier findings, difficult only mediated expectations in the outcome-focus conditions, but not in the effort-focus conditions.

Having shown a consistent set of patterns across 4 studies, I delve deeper into the process, and investigate the reasons underlying my effects—that is, why it is that efficacy does not affect inferences when focus is on effort.

I argue this may be because individuals pay different amounts of attention to their ability contingent on focus when providing estimates. In particular, when estimating effort (in the outcome focus condition), individuals with higher efficacy are more likely to pay attention to their ability relative to those with lower efficacy. However, when focusing on effort, individuals take this pre-specified effort as given, and assume they will be able to exert the predetermined effort; as a consequence, they give the same amount of paying attention to ability irrespective of

individual differences in efficacy. Because of this, the level of self-efficacy is not likely to influence estimation of outcomes.

I also test for other alternative explanations in this study. For instance, the relationship between outcomes and effort may not always be a one-to-one or a one-to-many relationship. Indeed, research suggests that superordinate goals (e.g., abstract goals) can be linked to many concrete focal and subordinate goals; however, subordinate goals, which are concrete, are usually only linked to one (or a few) focal superordinate goal (Bagozzi and Dholakia 1999). Due to the nature of this goal hierarchy, focusing on an outcome may prime multiple pathways to achieve this outcome, thus, leading to a one-to-many relationship. In contrast, when focusing on effort, individuals are likely to only have a one -to-one mapping. In other words, when focusing on outcomes, individuals may automatically think about all the different ways to achieve this outcome. Thus, one could posit that individuals with higher (vs. lower) efficacy might give more importance to their strategies when estimating effort. In contrast, when individuals focus solely on effort, because of the one-to-one relationship, regardless of differences in self-efficacy, they may give the same amount of importance to strategies when estimating outcomes.

I also consider another explanation. One might argue these effects emerge because of differences in estimation difficulty. That is, it may be easier (or more difficult, for that matter) to estimate effort from outcomes than it might be to estimate outcomes from effort. When outcomes are specified, individuals may be able to ascertain what it would take to achieve the said outcome, and hence may be more likely to pay attention to important relevant factors, such as self-efficacy. However, they may find it more difficult to estimate outcomes when focusing on effort because of which the effect of efficacy may be limited. An alternative hypothesis might be that it is more difficult to estimate effort from outcomes than it is to estimate outcomes from effort, and as a

consequence, individuals may rely more on self-efficacy when estimating effort than when estimating outcomes.

Thus, in the next study, I investigate the process underlying these effects and rule out several alternative explanations. Participants were told that the objective of this study was to evaluate how good college students are at memorization tasks (in particular, a list of words). The task was adapted from Baker, Bezance, Zellaby, and Aggleton (2004) (see also Davidson 2011). In the outcome-focus condition, I provided a list of words and asked participants to indicate how much time they would need to memorize these words. In the effort-focus condition, I gave participants a certain amount of time and asked them to indicate the number of words they would be able to memorize. I describe this study next.

STUDY 5: MEMORY TASK STUDY

Participants, Method, and Design

One hundred and ninety-three undergraduates participated in this study for course credit. Six participants did not complete the survey, and, therefore, their responses were excluded. The analyses reported use the remaining 187 responses (M_{age} = 21 years, 58% female).

All participants were told that the purpose of this study was to understand how good college students are at memory tasks. Half of the participants learned that their task was to learn and memorize a list of 15 words, taking as much time as needed (outcome-focus condition). The other half were informed that they would get a list of words, and their task was to learn and

memorize as many of these words as possible in 2 minutes (effort-focus condition). All participants were further informed that they would be asked to recall these words a few minutes later. In order to familiarize them with this memory task, participants were provided with five words that were similar to the ones in the main task.

For the actual task, a sample list of 30 words, which were matched for concreteness and imagery (Paivio, Yuille and Madigan, 1968), was created. In the outcome-focus condition, 15 words were selected randomly from this list of 30 words and shown to participants (thus, each participant saw a different list of 15 words); in the effort-focus condition, all 30 words were shown on one screen, however, the order of the words was randomly varied. These numbers were consistent with those used in prior research. For instance, Baker et al. (2004) used 15 words and 2 minutes, and suggested these as being equivalent for such a task.

Next, in the outcome-focus (effort-focus) condition, participants were asked to indicate the amount of time in minutes they would need to memorize all 15 words (the number of words they would be able to memorize in 2 minutes). This measure served as main dependent variable as it provided a measure of effort (outcome) expectations.

Participants were then asked to respond to several other measures. In the outcome-focus (effort-focus) condition, they indicated how much they thought about their ability to learn when estimating the amount of time needed (the number of words they would be able to memorize and recall; 1= not much at all, 7= a lot). This measure was used as the mediator.

Participants were also asked to respond to several other measures. They were asked to indicate how much they thought about different memory techniques when providing expectations (1= not much at all, 7= a lot). In addition, in the outcome-focus (effort-focus) condition, participants indicated how difficult it was to estimate the number of minutes they would need to

spend (the number of words they would be able to memorize correctly; 1= not difficult at all, 7= very difficult).

These two questions were used as alternative explanations and allowed me to test if focusing on outcomes leads individuals to think more about alternative means and to test if focusing on effort (vs. outcomes) has differential effects on estimation difficulty.

Participants then responded to the following three questions: "How well do you think you can perform on such kinds of memory tests" (1= not well at all, 7 = very well), "How good are you at memorizing words such as the ones used in the tests" (1= not good at all, 7 = very good) and "How good are you at recalling words such as the ones used in the tests" (1= not good at all, 7 = very good). These three measures were averaged to form a composite score reflecting participants' memory self-efficacy (α = .93).

After responding to all questions, participants took part in the actual memory test. I recorded the number of words participants were able to recall afterwards. This reflected actual performance. Thus, this study used a 2 (focus: outcome vs. effort) between subjects design with efficacy measured.

Results and Discussion

Effort (Outcome) Expectations. In this study the measurement unit was different across the two focus conditions. In the outcome-focus condition, participants indicated how much time (in minutes) they would need to memorize a list of 15 words, whereas, in the effort-focus condition, participants indicated how many words they would be able to memorize in 2 minutes. Because of this difference, I ran two separate regression analyses. In the outcome-focus

condition, a regression of effort expectations on self-efficacy revealed a significant main effect of efficacy (β = -1.51 $t(89) = -2.33$, $p < .03$), suggesting that efficacy affected effort expectations, such that estimated time decreased with increase in efficacy. On the other hand, consistent with my earlier findings, a similar regression in the effort-focus condition did not elicit a main effect of self-efficacy (β = .71 $t(94) = 1.64$, $p > .10$). Thus, participants' expectations of how many words they can memorize in 2 minutes were not influenced by efficacy. It may be important to note that the pattern of effects replicates when I used a combined analyses.

Thoughts about Learning Ability. I ran separate analyses in the outcome- and effort-focus conditions. I did this because the measurement units were different (minutes vs. the number of words, respectively). As expected, the regression elicited a main effect of self-efficacy in the outcome-focus condition (β = .27 $t(89) = 2.16$, $p < .04$), but not in the effort-focus condition (β = .19 $t(94) = 1.63$, $p > .10$).

Mediation Analysis. Because the measurement units (minutes vs. the number of words, respectively) differed in the two conditions (outcome vs. effort focus), I conducted mediation analysis separately for each focus condition. I tested for my proposed mediator–how much participants thought about their learning ability—along with the other potential explanations. In all of these simple mediations, I used 5000 bootstrapped samples and obtained 95% confidence intervals.

When thoughts about learning ability were used as a mediator, as expected, the effect of efficacy on effort expectations was fully mediated by the mediator in the outcome-focus

condition (CI: .0035 to .6351). However, the mediation was not significant in the effort-focus condition (CI: -.0685 to .3628; table 2A).

Table 2A

Study 5: Two Separate Simple Mediations – Mediator Thoughts about Learning Ability

Indirect Effect of Self-efficacy on Effort Expectations				
		B	S.E.	95% C.I.
Outcome-Focus	Thoughts about Learning Ability	.19	.15	.0035 to .6351

Indirect Effect of Self-efficacy on Outcome Expectations				
		B	S.E.	95% C.I.
Effort-Focus	Thoughts about Learning Ability	.03	.11	-.0685 to .3628

I also conducted similar mediation analyses with the other alternative mediators—thoughts about different memory techniques, and perceived difficulty of estimation. As expected, I did not find support for mediation with thoughts about different memory techniques (outcome-focus: -.2228 to .5327; effort-focus: -.7921 to .0852), as well as perceived difficulty of estimation (outcome-focus: -.3329 to .1280; effort-focus: -.3179 to .2391; table 2B), as the indirect effect of efficacy on expectations was not significant.

Table 2B

Study 5: Two Separate Simple Mediations – Mediator Thoughts about Different Memory Techniques

Indirect Effect of Self-efficacy on Effort Expectations				
		B	S.E.	95% C.I.
Outcome-Focus	Thoughts about Different Memory Techniques	.07	.18	-.2228 to .5327
	Perceived Difficulty of Estimation	-.02	.11	-.3329 to .1280

Mediator Perceived Difficulty of Estimation

Indirect Effect of Self-efficacy on Outcome Expectations				
		B	S.E.	95% C.I.
Effort-Focus	Thoughts about Different Memory Techniques	-.11	.20	-.7921 to .0852
	Perceived Difficulty of Estimation	-.01	.14	-.3179 to .2391

Performance. I tested whether manipulating focus moderates the effect of efficacious beliefs on actual performance (e.g., recalling the number of words correctly). I subjected the number of words correctly reported on focus (manipulated), self-efficacy (measured and mean-centered) and their interaction. However, none of the effects were significant (all *ps* > .20). In addition, I tested response times on the actual recall task as another measure of performance. None of the effects – focus, self-efficacy and their interaction – were significant (all *ps* > .16).

Discussion. This study provides more support for my main hypotheses. Indeed, efficacious beliefs affect effort expectations in the outcome-focus conditions, but not in the effort-focus conditions. Importantly, I show support for my suggested process—when focusing on outcomes, thoughts about learning ability mediated the effects of efficacy on expectations. However, when focus was on effort, I did not find any effects. Furthermore, I also rule out two alternative explanations—that is, these effects emerge because of differences in how outcomes

and effort are related to one another (i.e., whether they share a one-to-one relationship or one-to-many). As my findings suggest, focus did not impact retrieval of different memory techniques, and these memory techniques did not mediate my results. Furthermore, my results were also not impacted by differences in estimation difficulty.

In study 6, I focus on how efficacy influences the relationship between outcomes and effort in a marketing context. I told participants that they would be taking part in two ostensibly different studies. The objective of the first study was to assess how good adults are at solving mathematical problems. Participants were then told that while responding to the first study, we wanted them to take part in a different study; in this study we wanted them to evaluate an herbal chewing gum. I used the chewing gum to manipulate efficacy; half the participants learned that the gum helps improve performance in skill tests (placebo), while the other half learned that it improves oral health (control). Such kinds of manipulations have been used in past research; indeed, such forms of external cues can induce placebo effects and temporarily enhance self-efficacy beliefs (Shiv, Carmon and Ariely 2005a, 2005b). Bandura (1997) also suggests that placebo effects work by positively influencing efficacy beliefs. Thus, I expect to replicate my earlier results with this placebo manipulation. That is, I expect that when participants focus on outcomes, (placebo-induced) self-efficacy will impact effort expectations, however, when focus is on effort, self-efficacy will not affect outcome expectations.

STUDY 6: PROBLEM-SOLVING STUDY

Participants, Method, and Design

One hundred forty-two undergraduates participated in this study for course credit (M_{age} = 21 years, 57% female). The scenario indicated that the objective of this study was to understand how individuals solve mathematical problems. But, before proceeding with the actual project, we wanted to conduct a pilot study to establish some benchmarks based on college students' performances. In particular, we were interested in assessing how difficult these questions are, how long it takes to solve, and so on. We also wanted to assess how much we would need to pay participants to take part in the actual study. Participants were told that a few practice problems would be presented first, followed by a mini-test.

I used a placebo to manipulate efficacy; I told participants that I wanted them to take part in a different study at the same time. The scenario indicated that we were helping a chewing gum manufacturer understand consumers' perceptions of its herbal gum. So, participants were asked to chew this gum while completing the mathematical problem study; they were also told that a few questions would be asked about this gum at the end of the study. Half the participants learned that according to scientific studies, these herbs help improve performance in skill tests (placebo condition), while the other half learned that these herbs improve the health of their teeth and gums (control condition).

The main study then commenced. In order to familiarize participants with the kinds of problems they might encounter, I presented them with three practice questions. They were allowed to use a scrap paper and a calculator. Math problems for both the practice as well as the

mini-test were selected from the American College Test (ACT) practice test web site (http://www.actstudent.org/sampletest/).

After the practice task, I manipulated focus (outcome-focus vs. effort-focus). In the outcome-focus condition, participants were told that we would be offering a $100 payment, and we wanted to know the total number of questions they would be willing to solve correctly in return for this. In the effort-focus condition, they were informed that we would want them to solve 150 mathematical problems correctly, and we wanted to know the total amount of money they would want to receive in return. These questions were open-ended. A pretest had suggested that $100 was reasonable for solving 150 questions. In both conditions they were also asked to indicate how much time (in hours) they would be willing to spend on the task. As in study 2, two composite variables were created to compare across these two conditions–amount desired per question and time taken to answer each question. These measures served as main dependent variables, as they both provide a measure of effort (outcome) expectations.

Then, participants were informed that they would be taking part in a mini-test, where they would be asked to answer a total of ten questions. The amount of time to solve each question was recorded as well. I, thus, used a 2 focus (outcome-focus vs. effort-focus) x 2 efficacious beliefs (with placebo vs. without placebo) between subjects design.

Results and Discussion

Effort (Outcome) Expectations. An ANOVA with amount desired per question as the dependent variable elicited significant main effects of focus ($F(1,138) = 44.45$, $p < .0001$) and self-efficacy ($F(1,138) = 4.17$, $p < .05$). Participants in the outcome-focus condition expected to

be paid a higher amount per question relative to those in the effort-focus condition ($M_{\text{outcome-focus}}$ = \$3.53 vs. $M_{\text{effort-focus}}$ = \$.43); furthermore, participants in the placebo condition expected to be paid a lower amount per question relative to those in the control condition (M_{placebo} = \$1.50 vs. M_{control} = \$2.45).

These main effects were qualified by the predicted interaction of focus and self-efficacy ($F(1,138) = 4.30$, $p < .04$; see figure 6A). Consistent with my predictions, planned contrasts showed that in the outcome-focus condition, amount per question was lower when self-efficacy was higher (i.e., in the placebo condition) than when it was lower (i.e., in the control condition; M_{placebo} = \$2.57 vs. M_{control} = \$4.49, $p < .006$). However, in the effort-focus condition, amount per question was not influenced by (placebo-induced) self-efficacy (M_{placebo} = \$.44 vs. M_{control} = \$.42, $p > .90$).[3]

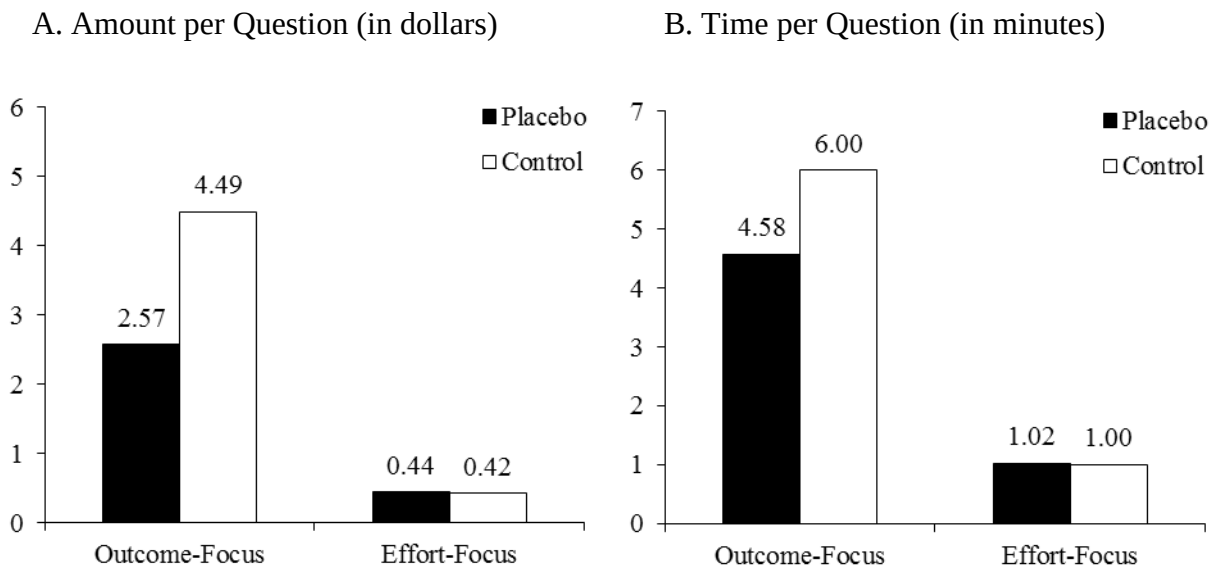
An ANOVA with time per question as the dependent variable revealed a similar pattern of results. A main effect of focus emerged ($F(1,138) = 52.91$, $p < .0001$). Participants in the outcome-focus condition expected to take more time per question relative to those in the effort-focus condition ($M_{\text{outcome-focus}}$ = 5.29 minutes vs. $M_{\text{effort-focus}}$ = 1.01 minutes). Even though the predicted interaction of focus and self-efficacy was not significant ($F(1,138) = 1.52$, $p > .20$), the pattern of results was consistent with my predictions (see figure 6B). As expected, in the outcome-focus condition, time per question was marginally lower in the high self-efficacy (placebo) condition relative to the low self-efficacy (control) condition (M_{placebo} = 4.58 minutes vs. M_{control} = 6.00 minutes, $p < .10$). However, in the effort-focus condition, time per question

[3] I also log-transformed amount desired per question and subjected it to an ANOVA. Only a significant main effect of focus emerged ($F(1,138) = 223.46$, $p < .0001$). Although the predicted two-way interaction of focus and efficacy was not significant ($F(1,138) = 2.53$, $p > .10$), the planned contrast were consistent with my hypotheses. Consistent with the untransformed analyses, in the outcome-focus condition, amount desired per question was greater when self-efficacy was lower (control) relative to when it was higher (placebo) ($p = .06$); however, in the effort-focus condition, amount desired per question was not influenced by self-efficacy ($p > .70$).

was not influenced by (placebo-induced) self-efficacy ($M_{placebo}$ = 1.02 minutes vs. $M_{control}$ = 1.00 minutes, $p > .90$).[4]

Figure 6

Study 6: Effort (Outcome) Expectations in Outcome (Effort) focus Condition



Effort (Outcome) Expectations with untransformed measurements. I also ran regression analyses separately in each focus condition. As expected, in the outcome focus condition, the effect of self-efficacy on the number of questions was significant ($M_{placebo}$ = 64.40 questions vs. $M_{control}$ = 44.41 questions; $t(65) = -1.96$, $p = .05$). However, in the effort-focus condition, the effect of self-efficacy on the amount of money desired was not significant ($M_{placebo}$ = \$65.48 vs. $M_{control}$ = \$63.33; $t(73) = -.21$, $p > .80$).

[4] I also log-transformed time per question. An ANOVA with time per question as the dependent variable also elicited only a significant main effect of focus ($F(1,138) = 184.07$, $p < .0001$). The interaction of focus and efficacy was not significant ($F(1,138) = 1.65$, $p > .20$), and the planned contrasts were also not significant (outcome-focus condition: $p > .20$; effort-focus condition: $p > .50$).

I also conducted an ANOVA with time desired to complete the task (in hours) as the dependent variable, and focus and self-efficacy as independent variables. The analyses revealed significant main effects of focus ($F(1,138) = 4.57$, $p < .04$) and self-efficacy ($F(1,138) = 3.78$, $p = .05$). Participants in the outcome-focus condition expected to spend more time relative to those in the effort-focus condition ($M_{\text{outcome-focus}} = 3.09$ hours vs. $M_{\text{effort-focus}} = 2.52$ hours); furthermore, participants in the placebo condition expected to spend more time than those in the control condition ($M_{\text{placebo}} = 3.06$ hours vs. $M_{\text{control}} = 2.54$ hours). These main effects were qualified by the predicted interaction of focus and self-efficacy ($F(1,138) = 2.89$, $p = .09$). Consistent with my predictions, planned contrasts showed that in the outcome-focus condition, the time desired was higher when self-efficacy was higher (i.e., in the placebo condition) than when it was lower (i.e., in the control condition; $M_{\text{placebo}} = 3.58$ hours vs. $M_{\text{control}} = 2.60$ hours, $p < .02$). However, in the effort-focus condition, time desired was not influenced by (placebo-induced) self-efficacy ($M_{\text{placebo}} = 2.55$ hours vs. $M_{\text{control}} = 2.49$ hours, $p > .80$).

Performance. I tested whether manipulating focus moderates the effect of placebo on actual performance (e.g., solving 10 questions). An ANOVA with the number of correct answers as the dependent variable did not reveal any significant effects (all *ps* > .30). Although placebo influenced expectations, it did not affect actual performance. In order to investigate this further, I computed the number of practice questions each participant answered correctly, and used that to create a continuous mathematical self-efficacy measure. It may be important to note that I did not provide performance feedback from the practice task, but instead used a placebo to manipulate efficacy.

A regression of performance on focus (effort vs. outcome) and measured self-efficacy (the number of practice problems solved correctly), and their interaction revealed only a main effect of self-efficacy (β = .57 $t(138) = 2.43$, $p < .02$), suggesting that performance improved with increases in measured self-efficacy. Thus, while expectations were influenced by placebo-induced self-efficacy manipulations, actual performance was not.

Discussion. This study replicates findings from my earlier studies using a placebo manipulation. Consistent with my predictions, in the outcome-focus condition, effort expectations differed as a function of self-efficacy; however, self-efficacy did not affect outcome expectations when focus was on effort. While my findings cohere with Bandura's argument (1997) that self-efficacy beliefs can be influenced by a placebo, they contradict his assertion that efficacy has a positive and symmetric effect irrespective of whether focus is on outcomes or on effort. Furthermore, while expectations were influenced by manipulated efficacy, interestingly, actual performance was not affected by placebo manipulation. In contrast, performance was influenced by measured self-efficacy—that is, how many practice questions participants correctly answered. However, I believe that this does not limit the contribution of my findings at all. My focus, consistent with a large literature on efficacy (Bandura 1997; Bagozzi and Warshaw 1990), is how individuals make decisions during goal initiation stage. These decisions are likely to be important and have consequences, as I discuss in the general discussion section.

CHAPTER 5 – GENERAL DISCUSSION

Self-efficacy forms a core tenet of goal setting theory because efficacy beliefs have been shown to influence goal choice (e.g., the goals people set), goal commitment, effort expended, perseverance, and performance (Bandura 1995; 1997; Locke and Latham 1990). Goals may be set in two different ways–from outcome (goal) to effort or from effort to outcomes (goals). Self-efficacy theory suggests that regardless of the process, self-efficacy should impact expectations. This is because self-efficacy affects individuals' estimates of how much effort is needed to reach a goal as well as expectations of future outcomes (Locke and Latham 1990).

However, across six studies I demonstrate that self-efficacy does not play a role when individuals decide on effort first. That is, self-efficacy influences effort expectations when focus is on outcomes, but not outcome expectations when focus is on effort. The results are quite robust and replicate across different contexts and using different measures of self-efficacy.

In study 1, I use GPA as a measure of self-efficacy and show that participants' effort expectations (e.g., the number of hours to study) varies as a function of self-efficacy when focus is on outcomes (getting 90%), but not outcome expectations when focus is on effort (studying for seven hours).

In study 2, using a general knowledge test, I find yet again that self-efficacy affects effort expectations when focus is on outcomes (earning $200), but does not affect outcome expectations when focus is on effort (completing 1,000 questions). I also provide additional support for these findings. In the outcome-focus condition, participants evaluate their ability to achieve goals and this self-evaluation of difficulty (time taken to answer questions) mediates the

effects of focus on effort expectations. In the effort-focus condition, participants' evaluations are not impacted by my focus manipulations.

In study 3, I delve further into the process by manipulating task difficulty in a weight loss context. I varied task difficulty and asked participants to estimate either effort (i.e., the number of hours of running required to lose a set amount of weight) or outcomes (i.e., the amount of pounds lost when running for a set amount of time). This study finds that self-efficacy does not influence outcome expectations (losing pounds) regardless of the level of difficulty (running 12 miles vs. 24 miles per week). However, the effect of self-efficacy on effort expectations (number of hours of running required) was dependent on the level of difficulty (losing 1 pound vs. 2 pounds per week). Because individuals with higher efficacy relied on their ability (internal information), their effort expectations did not differ as function of task difficulty; on the other hand, those with lower efficacy focused on the goal (external information), thus their effort expectations were influenced by task difficulty.

In study 4, I used individuals' current weight a measure of efficacy in a weight loss context. When current weight was made salient, the effect of current weight on effort expectations emerged when outcome expectations were predetermined; however, the effect of current weight on outcome expectations (when effort was predetermined) did not differ irrespective of whether current weight was salient or not.

In study 5, I show that when estimating effort from outcomes, participants with higher efficacy take their ability into greater consideration relative to those with lower efficacy. This consideration mediates the effect of self-efficacy on effort expectations. In contrast, when estimating outcomes from effort, individuals with both high and low levels of efficacy give their

ability equal consideration due to pre-specified effort, and because of this, the effect of the level of self-efficacy on outcome expectations is limited.

Finally, in study 6, I test my hypotheses using a placebo. These findings were consistent with my expectations.

It may be important to note that my focus was on the goal setting stage. Therefore, consistent with other literature in this area (Gollwitzer 1993, 1999), I focus on decisions made at goal-setting stage. Therefore, I do not always compare how effort versus outcome expectations map on to actual performance.

My research makes several contributions. I contribute to literatures on both self-efficacy beliefs and goal setting. I find that while efficacy beliefs matter if individuals set outcomes first, when effort is set first, efficacy beliefs do not matter. Thus, from a goal setting standpoint, it may be helpful for those lower in efficacy to focus on effort, as they are less likely to adopt tasks due to lower confidence to complete them if they focus on outcomes. For instance, in study 6, participants also were asked to indicate how difficult it would be to solve 10 questions correctly right before taking the mini-test. Main effects of focus ($F(1,138) = 4.17$, $p < .05$) and efficacy ($F(1,138) = 6.57$, $p < .02$) emerged. These effects were also qualified by a marginally significant interaction of focus and efficacy ($F(1,138) = 3.11$, $p = .08$). Consistent with my prior findings, when focus was on outcomes, participants with higher efficacy (in the placebo condition) felt the questions were easier than those in the control condition ($M_{\text{placebo}} = 3.58$ vs. $M_{\text{control}} = 4.56$, $p < .004$). However, when focus was on effort, there was no difference in difficulty perceptions between those in placebo condition and those in the control condition ($M_{\text{placebo}} = 3.51$ vs. $M_{\text{control}} = 3.69$, $p > .50$). Stated differently, these effects also show that in the control condition (i.e., without a placebo), focusing on effort elicited lower difficulty perceptions relative to when focus

was on outcomes ($p < .01$). Thus, it appears that focusing on effort can indeed lower difficulty perceptions and help goal adoption.

I also identify why these effects occurs. As I show, individuals with higher efficacy (vs. those with low efficacy) rely more on internal information (e.g., their ability) when estimating effort from pre-defined outcomes. However, both high and low efficacious individuals rely equally on internal information because of predetermined effort.

While the focus of my research was on understanding the role of efficacy, future researchers may want to consider how these different elicitation procedures impact other relevant factors. For instance, in study 4, I find that when focus is on effort, observers ignore information about the current state of the protagonist (i.e., Ben's current weight). This is suggestive of the possibility that such kinds of effects may emerge in situations where individuals are evaluating others. For instance, in managerial contexts, when managers set work-related expectations for employees, they may overlook characteristics of individual workers when they specify tasks. In contrast, when they set outcomes, they may be more likely to set expectations based on the individual worker's abilities. This may be a fruitful avenue for future researchers to consider.

Another possibility could be to investigate the role of individual beliefs. For instance, implicit theory suggests that individuals vary in terms of whether personal attributes are dispositional or changeable (Chiu, Hong, and Dweck 1997). In other words, some individuals view ability to be a static property (entity theorists), while others believe ability is changeable (incremental theorists)—that is, expending greater effort can have a positive impact on ability (Bandura 1993; Chiu et al. 1997). This is suggestive of the possibility that these individual differences may lead to differences in self-efficacy perceptions contingent on focus. For instance, self-efficacy perceptions of incremental theorists may be influenced more when focus is on effort

(vs. outcomes), as the process of investing effort can improve self-efficacy. In contrast, self-efficacy perceptions of entity theorists may be invariant to focus. These differences in perceptions may influence expectations, and may be worthy of future investigation.

These findings also contribute to several other research streams, ranging from research on procedural invariance to planning fallacy. Research on procedural invariance suggests that preference and choice should not be affected by the elicitation procedure used (Tversky, Sattath, and Slovic 1988; see also Slovic 1995; Tversky, Slovic and Kahneman 1990; Tversky and Kahneman 1986; Tversky and Thaler 1990). That is, if individuals have stable, well-defined preferences, and make rational choices which reflect their preferences, then elicitation method should not affect outcomes. However, individuals rarely have such stable preferences, and their responses are often influenced by the context as well as the procedure used to elicit these responses (Payne, Bettman, and Johnson 1992; Slovic 1995; Tversky and Thaler 1990). These effects are quite robust and have been replicated in a wide variety of contexts, ranging from choice of lotteries (e.g.,Tversky and Thaler 1990), evaluations of probabilities (e.g., Tversky and Kahneman 1986), questionnaire design (e.g., Tversky and Kahneman 1981), to general choice (e.g., Tversky et al. 1988). I extend this literature in two ways. First, I demonstrate that elicitation procedures also impact goal setting contexts. Second, I demonstrate a novel process that leads to procedural invariance. That is, I show that one elicitation process leads individuals to ignore an important characteristic (self-efficacy) that relates to goal setting and goal pursuit. This is suggestive of the possibility that other similar differences may be responsible for violations of procedural variances in other contexts, and maybe worthy of future investigation.

My findings may also contribute to the literature on planning fallacy (Buehler, Griffin and Ross 1994). This literature generally suggests that individuals are poor planners—they tend

to be optimistic when evaluating how much time they would need to complete future tasks. This occurs because individuals fail to take into account their past experiences when making future plans. My findings seem to suggest that elicitation procedures may also impact this. As I find, asking people to think about their goals leads them to think about efficacy, and this might help attenuate some of the effects observed in that literature. Future research can shed more light on this.

My research also has practical implications. Given that those with lower efficacy may be more reticent to start projects or take on difficult responsibilities, it might be more helpful for such individuals to focus on effort. In such situations they are less likely to take their lower efficacy into consideration, and may therefore not be as demotivated.

This also provides prescriptive suggestions for public policy makers. For instance, policy makers often set bench marks (e.g., for learning in educational contexts, or health measures in medical contexts). These bench marks specify minimum or maximum expectations, and are frequently outcome-based. For example, student learning objectives (SLOs) that are used to evaluate student and educator performances are based on student proficiency (for example, a goal might be that students in the eighth grade should be proficient in algebra or that students in second grade meet certain reading expectations). My research suggests that for students who have lower efficacy, it might be better to set bench-marks that are effort based. One possibility might be to ask them to solve 10 math problems every day or read for 20 minutes every day. It is likely that such an approach will develop proficiency without demotivating students. Similarly, in medical or health contexts, using task-oriented benchmarks (e.g., workout 30 minutes a day) relative to outcome oriented (e.g., lose 30 pounds) may be more fruitful in encouraging lower-

efficacy individuals to persist towards their health goals, and may be worthy of future investigation.

In summary, across six studies, I demonstrate that the effect of efficacy on expectations is moderated by focus (outcome vs. effort). In particular, I find that when individuals focus on outcomes, effort expectations are influenced by self-efficacy. However, when focus is on effort, efficacy does not influence outcome expectations. I also demonstrate the process, and rule out other alternative explanations. I conclude with a discussion of implications, and suggest avenues for future research.

REFERENCES

Austin, James T. and Jeffrey B. Vancouver (1996), "Goal Constructs in Psychology: Structure, Process and Content," *Psychological Bulletin*, 120 (3), 338-75.

Bagozzi, Richard P., and Paul R. Warshaw (1990), "Trying to Consume," *Journal of Consumer Research*, 17 (2), 127-40.

Bagozzi, Richard P. and Utpal Dholakia (1999), "Goal Setting and Goal Striving in Consumer Behavior," *Journal of Marketing*, 63 (Special Issue 1999), 19-32.

Baker, Jess R., Jessica B. Bezance, Ella Zellaby, and John P. Aggleton (2004), "Chewing Gum can Produce Context-Dependent Effects upon Memory," *Appetite*, 43 (2), 207-10.

Bandura, Albert (1977), "Self-Efficacy: Toward a Unifying theory of Behavioral Change," *Psychological Review*, 84 (2), 191-215.

_____ (1982), "Self-Efficacy Mechanism in Human Agency," *American Psychologist*, 37 (2), 122-47.

_____ (1986), *Social Foundations of Thought and Action: A Social Cognitive Theory*, Englewood Cliffs, NJ: Prentice-Hall.

_____ (1993), "Perceived Self-Efficacy in Cognitive Development and Functioning," *Educational Psychologist*, 28 (2), 117-48.

_____ (1995), *Self-efficacy in Changing Societies*, New York: Cambridge University Press.

_____ (1997), *Self-Efficacy: The Exercise of Control*, New York: Freeman

_____ (2006), "Guide for Constructing Self-Efficacy Scales," in *Self-Efficacy Beliefs of Adolescents*, ed. Pajare, Frank and Timothy C. Urdan, Greenwich, CT:IAP, 307-37.

Bandura, Albert and Daniel Cervone (1983), "Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems," *Journal of Personality and Social Psychology*, 45 (5), 1017-28.

Baumgartner, Hans and Rik Pieters (2008), "Goal-Directed Consumer Behavior," in *The Handbook of Consumer Psychology*, ed. Curtis P. Haugtvedt, Paul M. Herr, and Frank R. Kardes , New York, NY: Taylor & Francis, 367-92.

Bandura, Albert and Dale H. Schunk (1981), "Cultivating Competence, Self-efficacy, and Intrinsic Interest through Proximal Self-motivation," *Journal of Personality and Social Psychology*, 41 (3), 586-98.

Bettman, James R. (1979), *An Information Processing Theory of Consumer Choice*, Reading, MA:Addison-Wesley.

Bonezzi, Andrea, C. Miguel Brendl, and Matteo De Angelis (2011), "Stuck in the Middle: The Psychophysics of Goal Pursuit," *Psychological Science*, 22 (5), 607-12.

Brown, Irvin and Dillon K. Inouye (1978), "Learned Helplessness through Modeling: The Role of Perceived Similarity in Competence," *Journal of Personality and Social Psychology*, 36 (8), 900-08.

Brunsø, Karen, Joachim Scholderer, and Klaus G. Grunert (2004), "Closing the Gap Between Values and Behavior—a Means–End Theory of Lifestyle," *Journal of Business Research*, 57 (6), 665-70.

Buehler, Roger, Dale Griffin, and Michael Ross (1994), "Exploring the 'Planning Fallacy': Why People Underestimate Their Task Completion Times," *Journal of Personality and Social Psychology*, 67 (3), 366-81.

Chen, Gilad, Stanley M. Gully, and Dov Eden (2001), "Validation of a New General Self-Efficacy Scale," *Organizational Research Methods*, 4 (10), 62-83.

Chiu, Chi-yue, Ying-yi Hong, and Carol S. Dweck (1997), "Lay Dispositionism and Implicit Theories of Personality," *Journal of Personality and Social Psychology*, 73 (1), 19-30.

Davidson, Matthew. G (2011), "Herbal-Caffeinated Chewing Gum, But Not Bubble Gum, Improves Aspects of Memory," *Appetite*, 57 (1), 303-07.

Elias, Steven M. and Roos J. Loomis (2000), "Using an Academic Self-efficacy Scale to Address University Major Persistence," *Journal of College Student Development*, 41 (4), 450-54.

Fishbach, Ayelet, Tal Eyal, and Stacey R. Finkelstein (2010), "How Positive and Negative Feedback Motivate Goal Pursuit," *Social and Personal Psychology Compass*, 4 (8), 517-30.

Fitzsimons, Gavan J (2008), "Editorial: Death to Dichotomizing," *Journal of Consumer Research*, 35 (1), 5-8.

Frese, Michael, Judith Stewart, and Bettina Hannover (1987), "Goal-Orientation and Planfulness: Action Styles as Personality Concepts," *Journal of Personality and Social Psychology*, 52 (6), 1182-94.

Gollwitzer, Peter M. (1993), "Goal Achievement: The role of Intentions," *European review of social psychology*, 4 (1), 141-185.

_____ (1999), "Implementation Intentions: Strong Effects of Simple Plans," *American Psychologist*, 54 (7), 493-503.

Hayes, Andrew F. (2012), "Process: a Versatile Computational Tool for Observed Variable Mediation, Moderation and Conditional Process Modeling," Retrieved from http://www.afhayes.com/public/process2012.pdf

Hayes, Andrew F., Carroll J. Glynn, and Michael E. Huge (2012), "Cautions Regarding the Interpretation of Regression Coefficients and Hypothesis Tests in Linear Models with Interactions," *Communication Methods and Measures*, 6 (1), 1-11.

Heath, Chip, Richard P. Larrick, and George Wu (1999), "Goals as Reference Points," *Cognitive Psychology*, 38 (1), 79-109.

Hsieh, Peggy, Jeremy R. Sullivan, and Norma S. Guerra (2007), "A Closer Look at College Students: Self-efficacy and Goal Orientation," *Journal of Advanced Academics*, 18 (3), 454-76.

Hull, Clark L. (1932), "The Goal Gradient Hypothesis and Maze Learning," *Psychological Review,* 39 (1), 25-43.

Kivetz, Ran, Oleg Urminsky, and Yuhuang Zheng (2006), "The Goal-Gradient Hypothesis Resurrected: Purchase Acceleration, Illusionary Goal Progress, and Customer Retention," *Journal of Marketing Research,* 43 (1), 39-58.

Koo, Minjung and Ayelet Fishbach (2012), "The Small-Area Hypothesis: Effects of Progress Monitoring on Goal Adherence," *Journal of Consumer Research,* 39 (3), 493-503.

Kruglanski, Arie W, James Y. Shah, Ayelet Fishbach, Ron Friedman, Woo Young Chun and David Sleeth-Keppler (2002), "A Theory of Goal Systems," in *Advances in Experimental Social Psychology*, Vol. 34, San Diego, CA: Academic Press, 331-378.

Locke, Edwin A. and Gary P. Latham (1990), *A Theory of Goal Setting and Task Performance*, Englewood Cliffs, NJ: Prentice Hall.

Martocchio, Joseph J., and Jane Webster (1992), "Effects of Feedback and Cognitive Playfulness on Performance in Microcomputer Software Training," *Personnel Psychology*, 45 (3), 553-78.

Paivio, Allan, John C. Yuille, and Stephen A. Madigan (1968), "Concreteness, Imagery and Meaningfulness Values for 925 nouns," *Journal of Experimental Psychology*, 76 (1), 1-25.

Payne, John W., James R. Bettman, and Eric J. Johnson (1992), "Behavioral Decision Research: A Constructive Processing Perspective," *Annual Review of Psychology*, 43 (1), 87-131.

Salomon, Gavriel (1984), "Television is 'Easy' and Print is 'Tough': The Differential Investment of Mental Effort in Learning as a Function of Perceptions and Attributions," *Journal of Educational Psychology*, 76 (4), 647-58.

Schunk, Dale H (1981), "Modeling and Attributional Effects on Children's Achievement: A Self-efficacy Analysis," *Journal of educational psychology*, 73 (1), 93-105.

Shah, James Y. and Arie W. Kruglanski (2003), "When Opportunity Knocks: Bottom-Up Priming of Goals by Means and Its Effects on Self-Regulation," *Journal of Personality and Social Psychology*, 84 (6), 1109-22.

Shiv, Baba, Ziv Carmon and Dan Ariely (2005a), "Placebo Effects of Marketing Actions: Consumers May Get What They Pay For," *Journal of Marketing Research*, 42 (4), 383-93.

_____ (2005b), "Ruminating About Placebo Effects of Marketing Actions," *Journal of Marketing Research*, 42 (4), 410-14.

Skinner, Ellen A. (1996), "A Guide to Constructs of Control," *Journal of Personality and Social Psychology*, 71(3), 549-70.

Skinner, Ellen A, Michael Chapman, and Paul B. Baltes (1988), "Control, means-ends, and agency beliefs: A new conceptualization and its measurement during childhood," *Journal of Personality and Social Psychology*, 54(1), 117-133.

Skinner, Ellen A, James G. Wellborn, and James p. Connell (1990), "What It Takes to Do Well in School and Whether I've Got It: A Process Model of Perceived Control and Children's Engagement and Achievement in School," *Journal of Educational psychology*, 82 (1), 22-32.

Slovic, Paul (1995), "The Construction of Preference," *American Psychologist*, 50 (5), 364-71.

Smith, Sara Anne, Steven J. Kass, Rob J. Rotunda, and Sherry K. Schneider (2006), "If at First You Don't Succeed: Effects of Failure on General and Task-Specific Self-Efficacy and Performance," *North American Journal of Psychology*, 8 (1), 171-82.

Stajkovic, Alexander D. and Fred Luthans (1998), "Self-Efficacy and Work-Related Performance: A Meta-Analysis," *Psychological Bulletin*, 124 (2), 240-61.

Tversky, Amos, and Daniel Kahneman (1981), "The Framing of Decisions and the Psychology of Choice," *Science*, 211 (4481), 453-58.

_____ (1986), "Rational Choice and the Framing of Decisions," *Journal of Business*, 59 (4), S251-78.

Tversky, Amos, and Richard H. Thaler (1990), "Anomalies: Preference Reversals," *Journal of Economic Perspectives*, 4 (2), 201-211.

Tversky, Amos, Shmuel Sattath, and Paul Slovic (1988), "Contingent Weighting in Judgment and Choice," *Psychological Review*, 95 (3), 371-84.

Tversky, Amos, Paul Slovic, and Daniel Kahneman, (1990), "The Causes of Preference Reversal," *American Economic Review*, 80 (1), 204-17.

Weinberg, Robert S., Daniel Gould, and Allen Jackson (1979), "Expectations and Performance: An Empirical Test of Bandura's Self-efficacy Theory," *Journal of sport psychology*, 1 (4), 320-31.

APPENDIX A: SELF-EFFICACY MEASUREMENT

Study 2

How good are you at answering general knowledge questions? (1= not good at all, 7 = very good)
How well can you perform on other such general knowledge tests? (1= not well at all, 7 = very well)
How good are you at identifying correct answers for such kinds of questions? (1= not good at all, 7 = very good)

Study 3

Now please indicate the extent to which you agree or disagree with the following statements. (1= strongly disagree, 7= strongly agree)

1. I will be able to achieve most of the weight loss goals that I have set for myself.
2. When facing difficult weight loss goals, I am certain that I will accomplish them.
3. In general, I think that I can obtain weight loss outcomes if they are important to me.
4. I believe I can succeed at most any weight loss goal to which I set my mind.
5. I will be able to successfully overcome difficult workout routines.
6. I am confident that I can perform effectively on many different workout routines needed to lose weight.
7. Compared to other people, I can follow exercise plans very well.
8. Even when workout routines are tough, I can perform quite well.

Study 5

How well do you think you can perform on such kinds of memory tests? (1= not well at all, 7 = very well)
How good are you at memorizing words such as the ones used in the tests? (1= not good at all, 7 = very good)
How good are you at recalling words such as the ones used in the tests? (1= not good at all, 7 = very good)

Study 6

How good do you think you are at solving such kinds of mathematical problems? (1= not good at all, 7 = very good)
How well can you perform on other mathematical problems? (1= not well at all, 7 = very well)
How good are you at identifying solutions for such kinds of mathematical problems correctly? (1= not good at all, 7 = very good)

APPENDIX B: RESULTS

Study 1

DV: Effort/Outcome expectations

	β	*t*	*p*
Focus	-.36	-1.87	$p = .06$
Self-efficacy	-.86	-2.27	$p < .03$
Focus x Efficacy	1.12	2.12	$p < .04$

Conditional effect of efficacy on expectations at values of focus

	β	*t*	*p*
Outcome-focus	-.86	-2.28	$p < .03$
Effort-focus	.26	.71	$p > .45$

Study 2

DV: Amount per Question (in dollars)

	β	*t*	*p*
Focus	-1.67	-3.20	$p < .02$
Self-efficacy	-.91	-3.27	$p < .02$
Focus x Efficacy	.90	2.01	$p < .05$

Conditional effect of efficacy on dollar per question at values of focus

	β	*t*	*p*
Outcome-focus	-.91	-3.27	$p < .02$
Effort-focus	-.01	-.03	$p > .90$

DV: Time per Question (in seconds)

	β	*t*	*p*
Focus	-105.36	-2.88	$p < .005$
Self-efficacy	-70.65	-3.60	$p < .0005$
Focus x Efficacy	65.05	2.06	$p < .05$

Conditional effect of efficacy on time per question at values of focus

	β	*t*	*p*
Outcome-focus	-70.65	-3.60	$p < .0005$
Effort-focus	-5.60	-.23	$p > .80$

Study 3

Outcome-focus condition

DV: Effort expectations (in hours)

	β	*t*	*p*
Difficulty	-1.59	-2.17	$p < .04$
Self-efficacy	-.74	-1.89	$p = .06$
Focus x Efficacy	1.78	2.81	$p < .007$

Conditional effect of efficacy on effort expectation (in hours) at values of difficulty

	β	*t*	*p*
High difficulty	-.74	-1.89	$p = .06$
Low difficulty	1.04	2.08	$p < .05$

Effort-focus condition

DV: Outcome expectations (in pounds)

	β	*t*	*p*
Difficulty	-.08	-.18	$p > .80$
Self-efficacy	-.37	-1.45	$p > .15$
Focus x Efficacy	.46	1.20	$p > .20$

Conditional effect of efficacy on outcome expectations (in pounds) at values of difficulty

	β	*t*	*p*
High difficulty	-.37	-1.45	$p > .15$
Low difficulty	.09	.33	$p > .70$

Study 4

DV: Effort/Outcome expectations

	F	*p*
Focus	15.23	$p < .0001$
Initial weight	.38	$p > .50$
Salience of current state	.11	$p > .70$
Focus x Current state	.42	$p > .50$
Focus x Initial weight	3.64	$p = .06$
Current state x Initial weight	6.74	$p < .02$
Focus x Initial weight x Current state	3.75	$p = .05$

Current state x initial weight contrast interaction

	F	*p*
Outcome-focus	10.71	$p < .002$
Effort-focus	.21	$p > .64$

DV: Difficulty perception

	F	*p*
Focus	.91	$p > .30$
Initial weight	.00	$p > .90$
Salience of current state	.59	$p > .40$
Focus x Current state	.04	$p > .80$
Focus x Initial weight	1.79	$p > .18$
Current state x Initial weight	10.63	$p < .002$
Focus x Initial weight x Current state	5.00	$p < .03$

Current state x initial weight contrast interaction

	F	*p*
Outcome-focus	15.74	$p < .0001$
Effort-focus	.50	$p > .47$

Study 6

DV: Amount per Question (in dollars)

	F	*p*
Focus	44.45	$p < .0001$
Self-efficacy	4.17	$p < .05$
Focus x Efficacy	4.30	$p < .04$

DV: Time per Question (in minutes)

	F	*p*
Focus	52.91	$p < .0001$
Self-efficacy	1.41	$p > .20$
Focus x Efficacy	1.52	$p > .20$