

Goal Structure and Reference Points in Consumer Motivation

by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
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ABSTRACT

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Abstract

Goals play an essential role in many aspects of consumer behavior, and how best to effectively set and structure goals has long been a question of interest to researchers, marketers, and consumers in general. The same basic goal can be structured in many ways: by setting a specific goal of greater or lesser difficulty, by instead setting a range goal, by defining various subgoals along the way, or simply by aiming to do as well as possible. Although the intentions behind them are similar, these different ways of structuring a goal have important consequences for motivation and behavior. Prior research has explored several of these consequences, largely focusing on the difficulty and perceived value of the goal, on the level of ambiguity in its objectives, or on the level of commitment it produces. This dissertation takes a new perspective on this problem, examining the consequences of goal structure for the motivational and affective dynamics of goal pursuit. To explore this question in a comprehensive way, this research considers the salient reference points that are available during goal pursuit when goals are structured in various ways. This approach offers valuable new insights by connecting the issue of goal structure to the theory of goals as reference points, a prevailing framework in goals research more broadly. In three essays, I explore novel aspects of pursuing specific versus non-specific goals (Essay 1), of pursuing range goals (Essay 2), and of pursuing goals that focus on behavioral restraint rather than

achievement (Essay 3). Together, these essays offer valuable insights for effective goal-setting, strategies for effective goal pursuit, and theoretical contributions to research on the psychology of consumer goal pursuit.

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1. Introduction

Goals play a central role in consumer behavior. Consumers' goals shape their choices, their spending of money and time, their attention, their moment-to-moment happiness and even their overall wellbeing. The ubiquity of goals in consumers' lives has inspired numerous investigations into the psychological processes underlying goal pursuit. Over the years, one of the central questions in this literature has been, "How should goals be set?"

Oftentimes the same basic goal can be set or structured in many different ways. A dieter might aim to lose ten pounds or to lose between ten and fifteen pounds. He might focus on losing five pounds per month, on losing one pound per week, or just on reaching his ideal weight. He might simply aim to lose as much weight as possible.

Each of these goals is intended to motivate the same general behavior, but their seemingly superficial differences can have important consequences. Aiming higher or lower might change how difficult and how valuable the goal seems. Setting a more specific goal might make him more committed to it, or a range goal might make him more flexible and resilient. All of these factors will ultimately combine to determine what choices he makes while pursuing the goal, how well he performs, and how happy he is with both the experience and the outcome.

Although the documented effects of goal structure are substantial, there is still much to be learned, particularly regarding dynamic processes during the course of goal

pursuit. This dissertation sheds new light on the consequences of several major aspects of goal structure through an integrated theoretical framework. I identify how differences in goal structure change the reference points that consumers have available during goal pursuit, and I then explore how those changes influence the affective and motivational dynamics of goal pursuit. This approach is drawn from the theory of goals as reference points, which uses insights from research on judgment and decision-making to explore the world of goals. In particular, this theory looks at the cognitive process of evaluating goal outcomes and its role in shaping many aspects of motivation.

By taking this reference points approach to the question of goal structure, this dissertation offers important contributions to both respective literatures. First, this novel theoretical approach produces significant new insights for understanding the effects of goal structure. Second, applying the theory of goals as reference points to a wide array of goal structures serves to generalize the framework well beyond the narrow set of goals that have previously been examined.

In this dissertation, I begin by discussing prior research on the consequences of goal structure for goal pursuit and performance. Next I discuss prior research on the effects of goals as reference points. I then lay out three broad propositions for how goal structure influences behavior through the availability and use of reference points during goal pursuit. These propositions are then explored empirically in three essays. The

dissertation concludes with summary remarks and a discussion of opportunities for future research.

1.1 Goal Structure and Consumer Goal Pursuit

1.1.1 The Specificity-Difficulty Model

Many of the first empirical investigations into the effects of goal structure were focused on the comparison between specific, difficult goals and easy or do-your-best goals (Locke 1968; Locke et al. 1981; Mento, Steel, and Karren 1987). In drawing this comparison, researchers did not generally distinguish between specificity and difficulty – since non-specific or do-your-best goals could be satisfied by virtually any outcome, they simply fell at the bottom of end of a unified specificity-difficulty dimension (Wright and Kacmar 1994).

Ultimately, this stream of research came down in favor of specific, difficult goals. Early assertions about the performance benefits of such goals (Locke 1968) were followed by hundreds of empirical studies. These studies were eventually aggregated in literature reviews (Locke et al. 1981; Locke and Latham 1990) and meta-analyses (Mento et al. 1987) that found consistent evidence of the advantages of specific, difficult goals.

1.1.2 Goal Specificity as Degree of Ambiguity

As more and more researchers tested the specificity-difficulty performance question in their own areas of empirical interest, a subset of scholars called for further theoretical development. First and foremost, it became clear that goal specificity, defined

by the degree of “ambiguity or diffuseness in the exact level of performance required,” should be separable from the difficulty of the goal (Hollenbeck and Klein 1987; Naylor and Ilgen 1984; Wright and Kacmar 1994). Having distinguished these two constructs, researchers argued that specificity would not independently predict performance level, but that it may predict the degree of variability in performance (Locke et al. 1989; Klein, Whitener, and Ilgen 1990).

The effects of goal specificity, independent of difficulty, became more evident as researchers came to consider other consequences that only indirectly affected performance. Many such consequences have since been identified in the literature. To begin with, non-specific (vs. specific) goals are perceived as less difficult and more attainable (Ülkümen and Cheema 2011), which can encourage goal adoption (Locke and Latham 1990; Naylor and Ilgen 1984). For example, participants who set a non-specific goal to save money perceived the goal as easier to achieve than those who set a specific savings goal (Ülkümen and Cheema 2011). On the other hand, people also tend to feel less committed to non-specific (vs. specific) goals (Hollenbeck and Klein 1987; Naylor and Ilgen 1984), which makes non-specific goals more likely to be revised (Wright and Kacmar 1994), creates greater variability in performance outcomes (Klein, Whitener, and Ilgen 1990; Locke et al. 1989), and can lead to worse performance overall (Locke and Latham 1990; Locke et al. 1981). For example, participants with a non-specific task performance goal (e.g., brainstorm a list of product uses) felt less committed to their goal

and demonstrated greater variability in task performance across trials than did those with a specific goal (Wright and Kacmar 1994).

Another important conceptual development that followed the distinction between specificity and difficulty was the consideration of specificity as a continuum rather than a dichotomy. Whereas earlier work looked only at specific goals and purely non-specific do-your-best goals, range goals were later incorporated as intermediate options to create a full spectrum of specificity (Naylor and Ilgen 1984). This was a logical next step, given that range goals offer some information about the desired level of performance but not the black-and-white cutoff of a specific goal. However, because range goals were thus absorbed into the discussion of specificity, the potential impact of their unique features (e.g., the interpretation of their two defining endpoints) went largely overlooked in the goals literature until fairly recently (see Scott and Nowlis 2013).

In this dissertation, I will argue that another valuable way of thinking about goal structure is based on the benchmarks or standards that consumers naturally compare themselves to during the course of pursuing different goals. This perspective offers a unified explanation of several prior findings and, more importantly, sheds light on many novel consequences of goal structure for consumer goal pursuit. To explore this aspect of goal structure, I adopt the conceptual framework of goals as reference points.

1.2 Goals as Reference Points

A large body of research on judgment and decision-making has demonstrated that consumers' evaluations of the events and outcomes they experience are fundamentally relative. Making a given level of income this year feels very different depending on how much you made last year; receiving a given test score feels very different depending on what score you expected to get; and leaving a casino with a given amount of winnings feels very different depending on what happened throughout the night.

A cornerstone in this body of research is Prospect Theory (Kahneman and Tversky 1979), which outlines the essential features of the *value function* – the relationship between objective outcomes, the reference point, and experienced or anticipated utility. The key features of the value function are threefold. First, the reference point divides the range of possible outcomes into gains and losses. Rather than reacting to absolute outcomes, individuals translate them into relative outcomes compared to a reference point. Most often, this reference point is the status quo, such that other outcomes are evaluated as upward or downward changes from the present. A consumer's moment-to-moment happiness is not based on the fact that he may have \$60 in his pocket (his absolute state), but on the fact that he just found \$20 on the ground or that he accidentally dropped \$20 down a sewer grate (a gain or loss from his previous state, respectively). Second, the value function shows *loss aversion*, meaning that losses

are felt more strongly than equivalent gains. In other words, the loss side of the value function is steeper than the gain side. Thus the frustration of losing \$20 into the sewer is greater than the thrill of finding \$20 on the ground. This asymmetry also means that, if a single consumer were to find \$20 on the ground and then lose it down a sewer grate shortly thereafter, he would end up feeling worse than when he started. Third, the value function shows *diminishing sensitivity*, meaning that consumers react disproportionately to small gains or losses and are less sensitive to the differences between outcomes that are larger overall. In other words, the value function is steeper near the reference point than far from it. For example, the subjective difference between winning \$50 and winning \$150 is much greater than the difference between winning \$1050 and winning \$1150, even though both differ by the same amount (\$100).

The theory of goals as reference points (Heath, Larrick, and Wu 1999) links the core tenets of Prospect Theory to the world of goals and motivation, arguing that goal objectives behave like reference points and that motivation corresponds to the steepness of the value function at a given point during goal pursuit. Due to loss aversion, individuals are highly motivated before reaching a goal (in losses) and lose motivation immediately after passing it (in gains). Due to diminishing sensitivity, motivation increases as progress toward the goal accumulates (i.e., goal draws nearer) and, although already low, continues to decrease as he moves further beyond goal attainment. This new way of thinking about goals – as reference points – also helps to

explain a variety of other findings in goals research. For example, it explains why specific, difficult goals make people perform objectively better but feel less satisfied; it explains why performance outcomes tend to cluster around goal objectives; and it explains why people sometimes struggle to get started on difficult or long-term goals.

Following the introduction of the theory of goals as reference points, its subsequent development has been limited. The theory has been applied in many interesting contexts (Allen et al. 2016; Berger and Pope 2011; Bonezzi et al. 2011; Kivetz et al. 2006; Larrick et al. 2009; Medvec and Savitsky 1997; Medvec, Madey, and Gilovich 1995; Pope and Simonsohn 2011), but the scope of its implications has not been fully explored. I propose that the use of reference points has numerous implications for understanding how differences in goal structure influence goal pursuit, as outlined below.

1.3 Goal Structure: A Reference Points Approach

This dissertation argues that differences in reference points are an essential aspect of goal structure. For example, a specific goal differs from a do-your-best goal in that it offers a specific end-state reference point. Indeed, for “mere” specific goals (i.e., those with no incentives attached), this is the only discernible difference. Similarly, a range goal differs from a specific goal in that it offers two salient end-states rather than one. Given that reference points have such far-reaching effects, I propose that the differences in reference points associated with these different goal structures will have substantial implications for goal pursuit.

The reference points paradigm offers the opportunity to explore many novel effects of goal structure on consumer goal pursuit. One major benefit of this approach is that it illuminates the hedonic effects of structuring goals in different ways, rather than simply looking at performance outcomes. Another major benefit is that it sheds light on the dynamics of both affect and motivation during goal pursuit. Whereas most prior research on goal structure looks at the overall effects of different goals, a growing body of research in the related literature reveals goal pursuit to be a dynamic process in which motivation and cognition evolve with time and accumulated goal progress (e.g., Amir and Ariely 2008; Huang, Zhang, and Broniarczyk 2012; Kivetz et al. 2006; Koo and Fishbach 2008, 2012). I propose that a reference points approach will allow for a rich understanding of how goal structure influences the dynamics of affect and motivation over the course of goal pursuit.

1.3.1 Goal Specificity and Initial- versus End-State Reference Points

Goal specificity has played an important role in prior research, but that research has focused on differences in ambiguity rather than on differences in reference point focus. I propose that, whereas specific goal pursuers evaluate progress by comparing themselves to the end-state reference point, non-specific goal pursuers instead compare themselves to the initial-state reference point. This means that, as they accumulate progress, non-specific (vs. specific) goal pursuers will find themselves moving further from (vs. closer to) their salient reference point, creating a “reverse goal gradient” of decreasing motivation.

Furthermore, at any given point during goal pursuit, non-specific (vs. specific) goal pursuers will experience their state as a relative gain (vs. relative loss). This will make them more satisfied with their current state and also, due to loss aversion, decrease motivation by making additional progress seem less impactful.

1.3.2 Range Goals as Dual End-State Reference Points

Range goals have also played an important role in prior research, but have not yet been examined through the lens of reference points. Instead, ranges have often been treated as an intermediate level of specificity between specific and do-your-best goals. In this dissertation I consider the role of a range's two salient end-state reference points (i.e., the range endpoints) and their consequences for goal pursuit. From this perspective, ranges are not at all an intermediate between specific goals (with one end-state) and non-specific goals (with none), but are something else entirely.

A reference points approach offers new insights into range goals as a tool for effective goal-setting and goal pursuit. Prior work has focused on how ranges perform compared to specific goals in the aggregate, but such comparisons obscure important differences among goal pursuers. Depending on what strategies they use for pursuing range goals (i.e., their reference point focus), some individuals may perform just as well as if they had a specific goal at the very top of the range. Indeed, theory suggests that

some individuals might even perform better than if they had a high specific goal, if they make optimal use of the two available reference points (i.e., use a switching strategy).

Conversely, examining range goals offers valuable new insights for understanding reference points more generally. A major theoretical question in this area is how individuals focus and dynamically shift their attention when multiple reference points are available. Because ranges have two end-state reference points, they provide an excellent context for exploring this important theoretical issue.

1.3.3 Goal Structure and Reference Points for Restraint Behaviors

The goal domains discussed above and in most prior research are focused on achievement. How might the consequences of goal structure play out differently in other contexts like financial budgeting, dietary restriction, or time management? In domains such as these, the goal end-states that consumers set tend to be *worse* than the starting point, but the intent is to limit how much worse things can get. For example, if a consumer aims to spend less than \$1000 on his credit card next month, he will initially have spent \$0 (better than the target end-state of \$1000) and he will gradually spend money throughout the month (i.e., his current state will get worse).

Just like the pursuit of achievement goals, restraint goal pursuit is likely to be strongly influenced by reference points. The consumer described above will behave quite differently with his goal to spend less than \$1000 compared to if his limit were

\$800-\$1000, or if his goal were to spend as little as possible. However, I propose that the effects of these variations in goal structure will be very different from those observed for achievement goals. Focusing on a specific end-state reference point (vs. the initial-state) will make him feel better about his performance, whereas it has the opposite effect for achievement goals. Due to loss aversion, focusing on a specific end-state (vs. the initial-state) will tend to make him less motivated, whereas it enhances motivation for achievement goals. I propose that the fundamental differences between achievement and restraint goals have important implications for goal-setting, satisfaction, and motivation during consumer goal pursuit.

1.4 Overview of Essays 1, 2, and 3

Essay 1 examines how differences in reference point focus influence the dynamic motivational effects of goal specificity. Essay 2 examines the strategies consumers adopt for focusing and shifting their attention between the dual end-state reference points of a range goal, and how those strategies drive performance outcomes. Essay 3 examines how the relationships between goal structure, reference points, affect, and behavior play out differently in restraint versus achievement goal domains.

2. Essay 1: “How Goal Specificity Shapes Motivation: A Reference Points Perspective”

The relationship between goal progress and motivation is one of the most robust and well-known findings in the goal pursuit literature (Hull 1932; Kivetz, Urminsky, and Zheng 2006; Louro, Pieters, and Zeelenberg 2007; Nunes and Drèze 2011; Soman and Shi 2003). Often called the “goal gradient” or “goal-looms-larger” effect, accumulating progress towards a goal tends to make consumers more motivated to pursue it. Scholars have described this phenomenon as “the main insight from classic and modern research on motivation” (Koo and Fishbach 2012).

A prominent explanation for this effect comes from the theory of goals-as-reference points (Heath, Larrick, and Wu 1999). This theory posits that the desired end-state of a goal serves as a reference point during goal pursuit, producing a “value function” (Kahneman and Tversky 1979) that drives motivation as a function of distance to the goal end-state. Because the value function is steeper closer to the reference point, as consumers accumulate goal progress (i.e., grow closer to the goal’s end-state), each unit of marginal goal progress is perceived to have a greater impact on the overall goal, and this increases subsequent motivation. For example, a dieter with a goal to lose six pounds will be more motivated to lose the next pound when he has lost four pounds versus two pounds so far, because he is on a steeper part of the value function (i.e., closer to the goal end-state) and therefore sees losing the next pound as more impactful.

But what about goals that lack specific end-states? While this “reference points” explanation assumes that goals are defined by a specific end-state, many of consumers’ goals are not. Rather than striving to lose six pounds, for example, dieters may simply try to lose as much weight as possible, and rather than aiming to pay off \$500 of debt, consumers may simply try to pay off as much debt as possible. Such non-specific “do-your-best” goals are both common and important. When we asked U.S. adults ($N = 149$, 19 to 82 years, mean age 35.14 years, 60.8%

male) to list a series of personal goals and note whether each was associated with a specific end-state, half of the listed goals were non-specific (i.e., 611 out of 1188 goals lacked a specific performance objective). Participants also viewed these non-specific goals as equally important (1 = *Not important at all*, 7 = *Extremely important*) as their specific goals ($M_{\text{non-specific}} = 5.73$ vs. $M_{\text{specific}} = 5.78$; $t < 1$).

How does goal specificity shape motivation during goal pursuit? What effect might the absence of a specific end-state have on the relationship between goal progress and motivation? What role might reference points play in goal specificity's effects?

The present research examines these questions. We propose that, lacking a specific end-state, non-specific goal pursuers will use the initial-state (i.e., where goal pursuit began) as the reference point instead. Drawing on the value function's features of diminishing sensitivity and loss aversion (Kahneman and Tversky 1979), we develop a series of hypotheses that describe how this difference in focal reference points shapes the relationship between goal progress and motivation. We first consider how accumulating goal progress affects motivation to pursue non-specific (vs. specific) goals. Then, we examine when (i.e., at what level of goal progress) goal specificity produces the greatest difference in motivation. Finally, we explore the underlying mechanism driving these effects.

The findings make three main contributions. First, this research furthers understanding of the relationship between goal progress and motivation. While a substantial body of work shows that accumulating goal progress can increase motivation (Hull 1932; Kivetz et al. 2006; Nunes and Drèze 2011; Soman and Shi 2003), our findings provide a more nuanced perspective: whether accumulating goal progress increases or decreases subsequent motivation critically depends on goal specificity (i.e., the presence of an end-state reference point).

Second, this work furthers understanding of how goal specificity shapes motivation. Whereas goal specificity's effects have previously been attributed to ambiguity in how performance is evaluated (Wright and Kacmar 1994; Naylor and Ilgen 1984), we introduce a theoretical framework that predicts how motivation to pursue non-specific versus specific goals differs as a function of salient reference points.

Third, this work generalizes the theory of goals-as-reference points beyond goals that have specific performance objectives. Whereas previous tests of the existing framework have exclusively considered goals that provide an end-state reference point (Bonezzi, Brendl, and De Angelis 2011; Heath et al. 1999; Koo and Fishbach 2012), we develop and test novel predictions for goals that do not (i.e., non-specific goals). The findings underscore that goal specificity plays a key role in determining what reference points consumers adopt during goal pursuit.

2.1 Goal Specificity

Goal specificity is a defining characteristic of consumers' goals. Unlike specific goals, non-specific goals have some degree of "ambiguity or diffuseness in the exact level of performance required" (Hollenbeck and Klein 1987; Naylor and Ilgen 1984; Wright and Kacmar 1994). Whereas specific goals define a desired end-state objective (e.g., lose six pounds, pay off \$500 of debt), non-specific goals do not (e.g., lose as much weight as possible, pay off as much debt as possible). Non-specific goals can take different forms (e.g., range goals, Scott and Nowlis 2013), but the most common "do-your-best" type of non-specific goal lacks an end-state entirely (Locke and Latham 1990; Wright and Kacmar 1994).

Setting non-specific versus specific goals has a variety of consequences. Prior work finds that non-specific (vs. specific) goals are perceived as less difficult and more attainable (Ülkümen

and Cheema 2011), which encourages people to adopt them more readily (Locke and Latham 1990; Naylor and Ilgen 1984). Non-specific (vs. specific) goals are also less likely to evoke feelings of failure, which reduces goal abandonment (Kirschenbaum, Humphrey, and Malett 1981; Soman and Cheema 2004). People also tend to feel less committed to non-specific (vs. specific) goals (Hollenbeck and Klein 1987; Naylor and Ilgen 1984). This makes non-specific goals more likely to be revised (Wright and Kacmar 1994), creates greater variability in performance outcomes (Klein, Whitener, and Ilgen 1990; Locke et al. 1989), and can lead to worse performance overall (Locke and Latham 1990; Locke et al. 1981).

To explain these prior findings, researchers have argued that the absence of a specific end-state introduces ambiguity into how performance is evaluated (Wright and Kacmar 1994; Naylor and Ilgen 1984). Because for non-specific goals, the goal objective is less precisely defined, a broader range of outcomes can constitute success. For instance, whereas for a goal to lose six pounds, only that single outcome (losing six pounds) would achieve the goal, for a goal to lose as much weight as possible, multiple outcomes (e.g., losing four, six, or eight pounds) could potentially seem sufficient.

While this reasoning helps explain the previously documented effects, it offers limited insight into how goal specificity shapes motivation during goal pursuit. A growing body of research reveals goal pursuit to be a dynamic process in which motivation changes as consumers accumulate goal progress (e.g., Amir and Ariely 2008; Etkin and Ratner 2012; Huang, Zhang, and Broniarczyk 2012; Kivetz et al. 2006; Koo and Fishbach 2008, 2012). For non-specific (vs. specific) goals, how motivated will consumers be after accumulating different amounts of goal progress? If a dieter has a goal to lose as much weight as possible, for instance, how motivated would he be to lose more weight having lost two versus four (vs. six, etc.) pounds so far? And for

a given level of goal progress (e.g., four pounds lost), how would motivation differ if, rather than lose as much weight as possible, the dieter's goal was instead to lose six pounds exactly?

To address these questions and provide deeper insight into goal specificity's effects, the current research develops a theoretical framework that describes how the absence of a specific end-state influences motivation during goal pursuit. Central to our theorizing is the notion of reference points.

2.2 Goal Specificity: A Reference Points Approach

We propose that goal specificity alters what reference point consumers spontaneously adopt during goal pursuit, and that this difference in focal reference points has important implications for the relationship between goal progress and motivation.

A "reference point" divides the space of outcomes into regions of gain and loss (Kahneman and Tversky 1979). Outcomes above the reference point are evaluated as gains and outcomes below the reference point are evaluated as losses. The valuation of these gains and losses varies systematically based on the slope of Prospect Theory's value function, which is steeper closer to the reference point (i.e., diminishing sensitivity) and steeper on the loss side than on the gain side of the reference point (i.e., loss aversion) (Kahneman and Tversky 1979). Differences between outcomes along a steeper part of the value function have a greater influence on subsequent decisions (e.g., Kahneman 1992; Larrick, Heath, and Wu 2009; Tversky and Kahneman 1991).

While the notion of reference points has long been established, more recent research has attempted to understand where reference points originate (e.g., Abeler et al. 2011; Allen et al. 2016; Barberis 2013). One important source is consumers' goals. The theory of goals-as-

reference points (Heath et al. 1999) posits that the desired end-state of a goal serves as the reference point during goal pursuit, and goal-related outcomes (i.e., levels of goal progress) are evaluated relative to that end-state. For instance, if a dieter has a goal to lose six pounds, the dieter's reference point will be the goal objective (six pounds lost) and he will evaluate his current goal progress (e.g., four pounds lost so far) relative to that desired end-state.

We propose that, absent a specific end-state to serve as a reference point, non-specific goal pursuers will use the initial-state (i.e., where goal pursuit began) instead. Recent work finds that, in addition to the end-state, the initial-state of a specific goal can also serve as a reference point (Bonezzi et al. 2011; Carton et al. 2011; Koo and Fishbach 2008, 2012; Touré-Tillery and Fishbach 2012). While pursuing a goal to lose six pounds, for instance, either the end-state (i.e., the six-pound goal objective) or the initial-state (i.e., the dieter's previous weight, or zero pounds lost) could serve as the reference point. While the end-state is naturally more salient for specific goals (e.g., Heath et al. 1999; Kivetz et al. 2006), incidental factors that make the initial-state more salient (e.g., goal progress feedback, Koo and Fishbach 2012; visual cues, Bonezzi et al. 2011) can encourage people to adopt it as the reference point instead. Because the absence of an end-state should make the initial-state more salient, we argue that non-specific goal pursuers will spontaneously adopt the initial-state as the focal reference point.

2.3 Consequences for Motivation

We propose that this difference in focal reference points plays a key role in how goal specificity shapes motivation. According to the theory of goals-as-reference points (Heath et al. 1999), the slope of the value function determines motivation by changing people's subjective valuation of the impact of marginal goal progress (i.e., the "next step" of goal progress). Because

the value function is non-linear, the same objective increase in goal progress (e.g., losing one more pound) can be perceived as contributing more or less to the overall goal (e.g., lose six pounds). When one's current goal progress falls on a steeper part of the value function, marginal goal progress seems more impactful.

By determining the shape of the value function, salient reference points influence the subjective impact of marginal goal progress, and thus, motivation. As previously discussed, diminishing sensitivity makes the value function steeper when one's current state is closer to the reference point, and loss aversion makes the value function steeper when one's current state is below the reference point (i.e., on the "loss" rather than the "gain" side of the value function). Consequently, because marginal goal progress seems more impactful when the value function is steeper, motivation is higher when consumers' current goal progress puts them closer to their focal reference point or on the loss side of that reference point (Bonezzi et al. 2011; Heath et al. 1999; Koo and Fishbach 2012).

We argue that goal specificity influences the shape of the value function, and thus changes how accumulating goal progress affects subsequent motivation. For specific goals, diminishing sensitivity should make the value function steeper closer to the (more salient) end-state (Heath et al. 1999). Consequently, as consumers accumulate goal progress, they move closer to their focal reference point (and onto a steeper part of the value function), which makes marginal goal progress seem more impactful and increases subsequent motivation (i.e., the "goal gradient" effect; Kivetz et al. 2006).

For non-specific goals, however, diminishing sensitivity should make the value function steeper closer to the (more salient) initial-state. Consequently, as consumers accumulate goal progress, they move *further away* from their focal reference point (and onto a shallower part of the value function). This should make marginal goal progress seem *less* impactful and therefore

decrease subsequent motivation. For example, the dieter with a goal to lose as much weight as possible should see losing the next pound as having *less* of an impact on his overall weight loss goal, and thus be *less* motivated to lose more weight, after having lost four pounds (further from zero) versus two pounds (closer to zero) so far. For non-specific goals, we thus predict a reverse goal gradient: accumulating goal progress will decrease subsequent motivation, driven by a decrease in the subjective impact of marginal goal progress.

Our reasoning thus far describes a crossover interaction between goal specificity and goal progress (figure 1): for specific goals, motivation starts low (far from the focal end-state reference point) and increases with accumulated goal progress; for non-specific goals, motivation starts high (near the focal initial-state reference point) and decreases with accumulated goal progress. This suggests that when goal progress is relatively high, non-specific goal should be less motivating than specific goals, but when goal progress is relatively low, non-specific goals should be more motivating than specific goals.

Rather than a symmetrical crossover, however, we argue that loss aversion will produce an asymmetry in this interaction (figure 1). Whereas focusing on the end-state locates current goal progress on the loss side of the value function (e.g., \$250 below a savings goal of \$500), focusing on the initial-state locates current goal progress on the gain side (e.g., \$250 above a starting point of \$0). Because loss aversion makes losses steeper than gains, for a given level of goal progress, focusing on the end-state (vs. initial-state) as the reference point should put consumers on a steeper part of the value function. Together with the effect of diminishing sensitivity, this suggests that the value function should be at its steepest (shallowest) when current goal progress is *both* close to (far from) the focal reference point and on the loss (gain) side of that reference point.

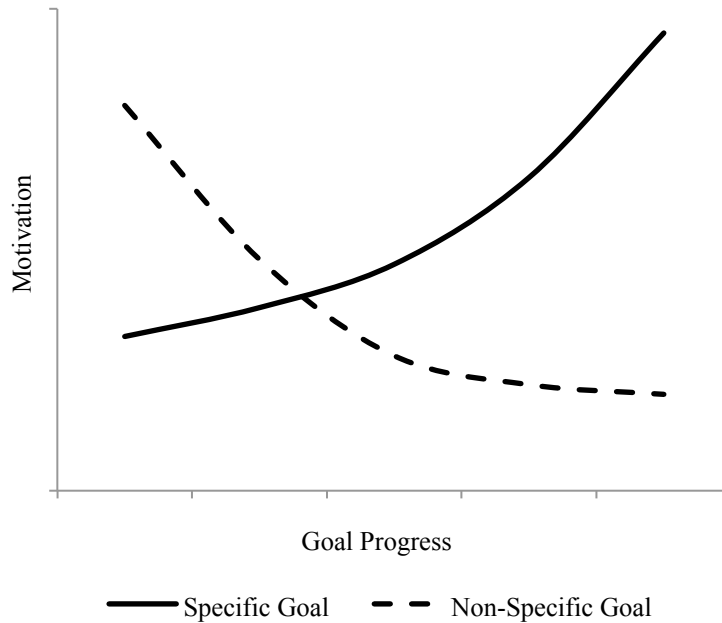


Figure 1. Predicted Effects of Goal Specificity and Goal Progress on Subsequent Motivation.

Consequently, with respect to goal specificity, the value function should be steepest for specific goals at high goal progress (loss side of the value function, close to the end-state reference point) and shallowest for non-specific goals at high goal progress (gain side of the value function, far from the initial-state reference point) (figure 2). At low goal progress, the effects of diminishing sensitivity and loss aversion should act in opposition, with a net result of more moderate motivation for both specific and non-specific goals (figure 2).

	Low Progress	High Progress
Specific	Far + Loss	Close + Loss
Non-Specific	Close + Gain	Far + Gain

Figure 2. Position Relative to Focal Reference Point

We thus predict that goal specificity will produce a greater difference in the subjective impact of marginal goal progress (and thus motivation) at higher (vs. lower) levels of goal progress. In particular, when goal progress is high, non-specific goals should decrease subjective impact (and motivation) relative to specific goals, but when goal progress is low, these effects should be attenuated.¹

In summary, we predict:

- H1:** For non-specific goals (specific goals), accumulating goal progress decreases (increases) subsequent motivation.
- H2:** When current goal progress is high, non-specific goals reduce motivation relative to specific goals, but this effect is attenuated when current goal progress is low.
- H3:** These effects are driven by the subjective impact of marginal goal progress.

Five studies tested our hypotheses. Study 1 used an effortful lab task to examine how goal specificity shapes motivation. Studies 2 and 3 used realistic scenarios in important consumer

¹ When current goal progress is low, the subjective impact of marginal goal progress (and motivation) will depend on the tension between diminishing sensitivity (which should favor non-specific goals) and loss aversion (which should favor specific goals). If goal progress is sufficiently low (i.e., the distance from the focal reference point sufficiently small) to outweigh the effect of being in gains (vs. losses), then non-specific goals may in fact increase motivation relative to specific goals (figure 2).

goal domains (debt repayment in Study 2; weight loss in Study 3) to provide more controlled tests of our motivation predictions and examine the proposed underlying role of the subjective impact of marginal goal progress. Studies 4a and 4b further tested the proposed underlying process by directly manipulating the focal reference point. Together the findings show that how goal specificity shapes the dynamics of motivation depends on the different reference points that non-specific (vs. specific) goals make salient.

2.4 Study 1

Study 1 tests our first two hypotheses by examining effort on a goal-directed task: proofreading passages of text. We manipulated goal specificity and then measured motivation (i.e., persistence) at different points throughout the task. In the specific goal condition, we predicted that accumulating goal progress would increase subsequent motivation: after finding a greater number of errors, participants should work harder to find additional errors. In the non-specific goal condition, however, we predicted that accumulating goal progress would instead decrease subsequent motivation: after finding a greater number of errors, participants should work *less* hard to find more errors. Further, due to loss aversion, we predicted that the non-specific goal would be less motivating than the specific goal at the highest level of goal progress, but this effect would be reduced at lower progress levels.

2.4.1 Design and Method

Participants ($N = 155$) were recruited from a university behavioral lab in exchange for course credit. In this and subsequent lab studies, lab capacity and participant availability determined the sample size. Ten individuals (6%) reported technical problems completing the study (e.g., failure to load a page) and were excluded from the analyses, leaving a sample of 145 (average age = 24.67 years, 59% female). Participants were randomly assigned to one condition

of a 2 (goal specificity: specific, non-specific) x 3 (goal progress: low, intermediate, high) between-subjects design.

Participants read that they would be proofreading a series of short text passages and that there was one spelling error in each passage. In the specific goal condition, we told participants that their goal was to “find 10 errors in a row.” In the non-specific goal condition, we told participants that their goal was to “find as many errors as possible in a row.” All participants read that if they failed to find the error in a given passage, their streak would end, and they would not be able to restart their streak or revisit the failed passage. After completing a practice passage, participants began the main proofreading task.

Participants proceeded through the proofreading task, as instructed, and were given a running count of how many errors they had found so far (which equaled the number of passages they had completed). After finding two (low progress condition), five (intermediate progress condition), or eight errors (high progress condition), we paused the task. We told participants that the remaining proofreading passages would be more difficult, and that if they failed to find the spelling error in one of the passages, they could quit the task (and end their streak).

Then, participants returned to the main task, and we measured motivation. The next (target) text passage contained no spelling errors, meaning that in order to advance beyond this page, all participants eventually had to quit. We recorded how long participants persisted (i.e., how much effort they invested) in trying to find the error before quitting. Persistence time was log-transformed for analysis to correct for non-normality (Kolmogorov-Smirnov test statistic: .11, $p < .01$); raw means are reported for ease of interpretation.

2.4.2 Results

A 2 (goal specificity) x 3 (goal progress) ANOVA on motivation (i.e., persistence time) revealed a main effect of goal specificity ($M_{\text{specific}} = 146.53$, $M_{\text{non-specific}} = 105.93$, $F(1, 139) = 7.24$,

$p = .008$), qualified by the predicted interaction ($F(2, 139) = 6.19, p = .003$; figure 3). There was no main effect of goal progress ($F < 1$).

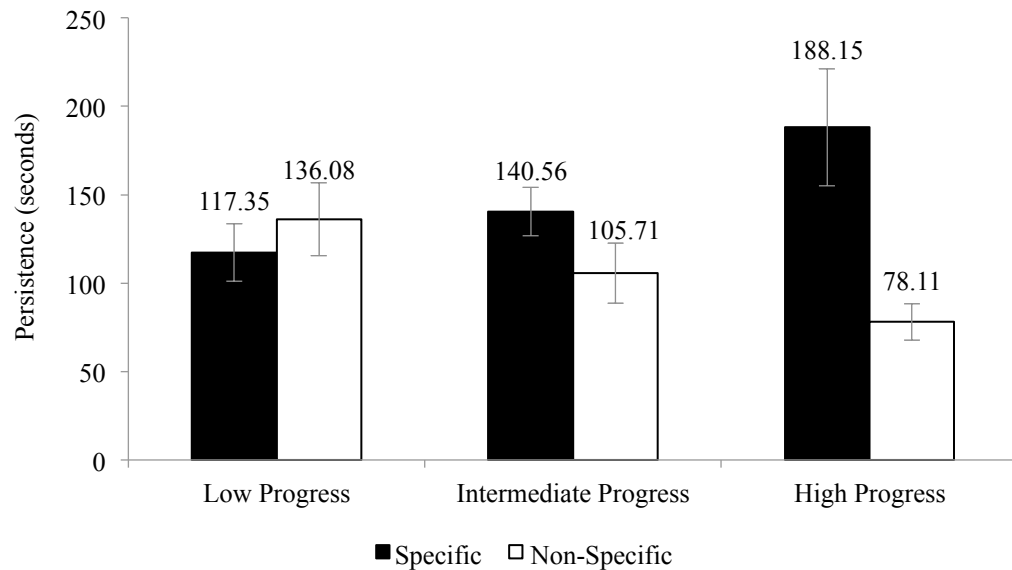


Figure 3. Goal Specificity Affects Proofreading Effort

As expected, in the specific goal condition, accumulating goal progress increased subsequent motivation (linear contrast: $F(1, 139) = 4.90, p = .028$). Participants expended more effort on the target passage (i.e., worked harder to find the non-existent error) after finding five errors ($M = 140.56$ sec) versus two errors ($M = 117.35$ sec), and after finding eight errors ($M = 188.15$ sec) versus five errors. However, supporting H1, in the non-specific goal condition, the opposite occurred: accumulating goal progress *decreased* subsequent motivation (linear contrast: $F(1, 139) = 7.78, p = .006$). Participants expended *less* effort on the target passage after finding five errors ($M = 105.71$ sec) versus two errors ($M = 136.08$ sec), and after finding eight errors ($M = 78.11$ sec) versus five errors. See table 1 for pairwise contrasts.

Further, supporting H2, when goal progress was high, the non-specific goal reduced motivation relative to the specific goal. After finding eight errors, participants in the non-specific goal condition expended less effort on the target passage than did those in the specific goal condition ($M_{\text{non-specific}} = 78.11$ sec, $M_{\text{specific}} = 188.15$ sec; $F(1, 139) = 15.21, p < .001$). This effect was reduced, however, at intermediate progress (five errors, $M_{\text{non-specific}} = 105.71$ sec, $M_{\text{specific}} = 140.56$ sec; $F(1, 139) = 3.00, p = .085$) and directionally reversed at low goal progress (two errors, $M_{\text{non-specific}} = 136.08$ sec, $M_{\text{specific}} = 117.35$ sec; $F(1, 139) = 1.06, p = .305$).

2.4.3 Discussion

Study 1 supports our first two hypotheses with effortful behavior on a goal-directed task. Consistent with prior work (e.g., Heath et al. 1999; Kivetz et al. 2006; Nunes and Drèze 2011), when participants had a specific goal, accumulating goal progress increased subsequent motivation. The more progress participants had made in the proofreading task (i.e., the greater the number of errors they had found so far), the more effort they expended on the target passage. Importantly, as predicted (H1), when participants had a non-specific goal, the opposite occurred: accumulating goal progress *decreased* subsequent motivation. The more progress participants had made in the task, the less effort they expended on the target passage.

Also as predicted (H2), when goal progress was high, the non-specific goal reduced motivation relative to the specific goal. This effect was attenuated (and directionally reversed), however, at the lower goal progress levels. Because high goal progress is where the effect of loss aversion reinforces that of diminishing sensitivity (figure 2), this is where goal specificity had the biggest effect on subsequent motivation.

2.5 Study 2

Study 2 tests the proposed underlying process (H3) in a common and important goal domain: debt repayment. We manipulated the specificity of a debt repayment goal, provided participants with goal progress feedback, and then in addition to measuring motivation, we asked them to rate the impact of an incremental step of goal progress (saving an additional \$25) on their overall debt repayment goal.

In this and subsequent studies, we use realistic goal scenarios to provide more controlled tests of our predictions. Although Study 1 held the (perceived) rate of goal progress constant, the overall amount of effort invested prior to reaching the target passage differed by condition. Consequently, in the non-specific goal condition, depletion may have played a role in why accumulating goal progress decreased subsequent motivation. By manipulating goal progress independently of actual effort investment, scenario-based paradigms eliminate this potential confound, allowing us to more precisely test the proposed underlying mechanism. This approach is consistent with prior research on goals-as-reference points, which has extensively used scenario-based paradigms (e.g., Heath et al. 1999) and found them to show the same effects as real behavior (see Wu, Heath, and Larrick 2008 for a review).

2.5.1 Design and Method

Participants ($N = 320$) were recruited from Amazon Mechanical Turk in exchange for small payment. In this web-based study, a target rule of 50-60 participants per condition determined the sample size. Thirteen individuals (4%) initiated the study but failed to complete it, leaving a sample of 307 responses for analysis (average age = 35.04 years, 44.0% female). Due to the online format, we were unable to ask participants their reasons for exiting, but attrition did not differ across conditions. Participants were randomly assigned to one condition in a 2 (goal

specificity: specific, non-specific) x 3 (goal progress: low, intermediate, high) between-subjects design.

First, we manipulated goal specificity. We asked participants to imagine they had \$10,000 in loans to pay off over time, and that they decided to pay down their loans faster by cutting back on spending. In the specific goal condition, participants read that their goal this month was to “pay off an extra \$500.” A pretest conducted with a separate sample from the same population confirmed that this amount (\$500) was comparable to what people would naturally plan to pay off in a month (see appendix A for details). In the non-specific goal condition, participants read that their goal this month was to “pay off as much extra as you can.”

Second, we provided goal progress feedback. Participants read that partway through the month, they were planning to go out to dinner with a friend, and that so far this month they had saved \$50 (low progress condition), \$250 (intermediate progress condition), or \$450 (high progress condition) to put toward their loans. A pretest conducted with a separate sample from the same population confirmed that in both goal specificity conditions, perceived goal progress increased from \$50 to \$250 and from \$250 to \$500 (see appendix B for details).

Third, we measured the subjective impact of marginal goal progress. We asked participants, “At this point, how much of an impact would saving an **additional \$25** have on helping you reach your goal for the month?” (1 = *No impact at all*, 7 = *Very large impact*).

Finally, we measured motivation. We reasoned that the more motivated participants were to put money toward their debt repayment goal, the less money they should be willing to spend on dinner with their friend. Accordingly, we asked them, “How much money would you be willing to spend on this dinner with your friend?” (open-ended in dollars), where larger values indicated lower motivation to conserve money. Willingness-to-pay was log-transformed for analysis to

correct for non-normality (Kolmogorov-Smirnov test statistic: .23, $p < .01$); raw means are reported for ease of interpretation.

2.5.2 Results

Motivation. A 2 (goal specificity) x 3 (goal progress) ANOVA on motivation (i.e., willingness-to-pay) revealed a marginal main effect of goal specificity ($M_{\text{non-specific}} = \30.83 , $M_{\text{specific}} = \$26.75$; $F(1, 301) = 3.25$, $p = .073$) qualified by the predicted interaction ($F(2, 301) = 10.76$, $p < .001$; figure 4). There was no main effect of goal progress ($F < 1$).

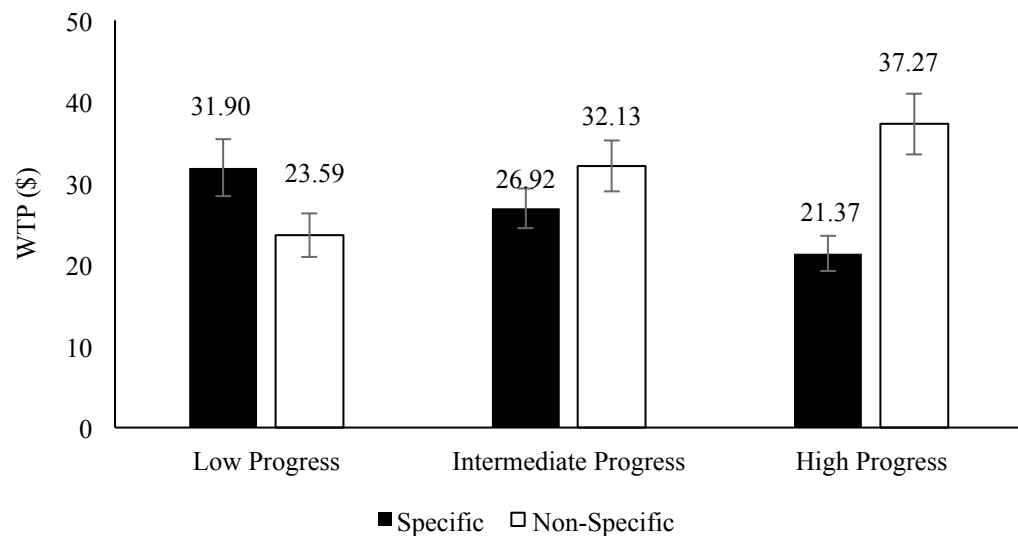


Figure 4. Goal Specificity Affects Motivation to Pay off Debt. Note that greater willingness to pay corresponds to lower motivation to conserve money.

Consistent with Study 1, in the specific goal condition, accumulating goal progress increased subsequent motivation (linear contrast: $F(1, 301) = 8.83$, $p = .003$). Participants were more motivated to conserve money (i.e., willing to spend less money on dinner) after putting

\$250 ($M = \26.92) versus \$50 ($M = \31.90) toward their loans, and after putting \$450 ($M = \21.37) versus \$250 toward their loans. However, supporting H1, in the non-specific goal condition, the opposite occurred: accumulating goal progress *decreased* subsequent motivation (linear contrast: $F(1, 301) = 12.65, p < .001$). Participants were *less* motivated to conserve money (i.e., willing to spend *more* money on dinner) after putting \$250 ($M = \32.13) versus \$50 ($M = \23.59) toward their loans, and after putting \$450 ($M = \37.27) versus \$250 toward their loans. See table 1 for pairwise contrasts.

Further, consistent with Study 1 and supporting H2, when goal progress was high, the non-specific goal reduced motivation relative to the specific goal. After paying off \$450, participants in the non-specific goal condition were less motivated to conserve money (i.e., willing to spend more on dinner) than those in the specific goal condition ($M_{\text{non-specific}} = \$37.27, M_{\text{specific}} = \$21.37; F(1, 301) = 16.71, p < .001$). This effect was reduced, however, at intermediate goal progress (\$250; $M_{\text{non-specific}} = \$32.13, M_{\text{specific}} = \$26.92; F(1, 301) = 2.04, p = .154$), and it reversed (although the effect was smaller, consistent with our theory) at low goal progress (\$50; $M_{\text{non-specific}} = \$23.59, M_{\text{specific}} = \$31.90; F(1, 301) = 5.89, p = .016$).

Subjective Impact. A 2 (goal specificity) x 3 (goal progress) ANOVA on subjective impact revealed only the predicted interaction ($F(2, 314) = 11.54, p < .001$). There was no main effect of goal specificity ($F(1, 301) = 2.51, p = .114$) or goal progress ($F < 1$).

As expected, in the specific goal condition, accumulating goal progress increased the subjective impact of marginal goal progress (linear contrast: $F(1, 301) = 6.48, p = .011$). Saving an additional \$25 was perceived to have a bigger impact on the overall debt repayment goal when participants had already put \$250 ($M = 4.16$) versus \$50 ($M = 3.74$) toward their loans, and when they had already put \$450 ($M = 4.49$) versus \$250 toward their loans. However, supporting our theory, in the non-specific goal condition, the opposite occurred: accumulating goal progress

decreased the subjective impact of marginal goal progress (linear contrast: $F(1, 301) = 12.70, p < .001$). Saving an additional \$25 was perceived to have *less* of an impact on the overall debt repayment goal when participants had already put \$250 ($M = 3.65$) versus \$50 ($M = 4.49$) toward their loans, and when they had already put \$450 ($M = 3.44$) versus \$250 toward their loans. See table 1 for pairwise contrasts.

Table 1. Pairwise Contrasts Between Goal Progress Conditions

Study (DV)		Specific Goal			Non-Specific Goal		
		Low vs. Middle	Middle vs. High	Low vs. High	Low vs. Middle	Middle vs. High	Low vs. High
1 (Log Time)	$F(1, 139)$	2.17	.77	4.90**	1.69	1.72	7.78***
	p	.143	.381	.028	.196	.192	.006
2 (Log WTP)	$F(1, 301)$	1.64	3.54*	8.83***	6.50**	.91	12.65***
	p	.202	.061	.003	.011	.341	< .001
2 (Impact)	$F(1, 301)$	2.29	1.43	6.48**	7.88***	0.50	12.70***
	p	.132	.232	.011	.005	.479	< .001

Note—Pairwise contrasts in each goal specificity condition of Studies 1-2: low vs. intermediate goal progress, intermediate vs. high goal progress, and low vs. high goal progress. As expected, the low vs. high goal progress contrast emerged as significant in each case. * $p < .10$, ** $p < .05$, *** $p < .01$

Further supporting our reasoning, when goal progress was high, the non-specific (vs. specific) goal reduced the subjective impact of marginal goal progress. After paying off \$450, participants in the non-specific goal condition perceived saving an additional \$25 as less impactful than those in the specific goal condition ($M_{\text{non-specific}} = 3.44, M_{\text{specific}} = 4.49; F(1, 301) = 12.45, p < .001$). This effect was reduced, however, at intermediate goal progress (\$250, $M_{\text{non-specific}} = 3.65, M_{\text{specific}} = 4.16; F(1, 301) = 3.17, p = .077$), and it reversed (although the effect was

smaller, consistent with our theory) at low goal progress (\$50, $M_{\text{non-specific}} = 4.49$, $M_{\text{specific}} = 3.73$; $F(1, 301) = 7.88$, $p = .005$).

Underlying Process. To examine the proposed underlying role of the subjective impact of marginal goal progress, we ran a bias-corrected bootstrapping mediated moderation analysis with 5000 samples (PROCESS Model 7, Hayes 2013). Results supported H3, revealing a significant index of mediated moderation (index: $-.06$, 95% CI $[-.12$ to $-.01]$). In the specific goal condition, accumulating goal progress increased motivation to conserve money (i.e., decreased willingness to spend money on dinner), driven by seeing marginal progress as more impactful ($ab = -.02$, 95% CI $[-.06$ to $-.002]$). In the non-specific goal condition, however, accumulating goal progress decreased motivation to conserve money (i.e., increased willingness to spend money on dinner), driven by seeing marginal progress as less impactful ($ab = .03$, 95% CI $[.008$ to $.07]$).

2.5.3 Discussion

Study 2 supports our motivation hypotheses in an important goal domain (debt repayment) and demonstrates the underlying process. Consistent with Study 1 and supporting H1, when participants had a specific (non-specific) goal to pay off debt, accumulating goal progress increased (decreased) subsequent motivation to conserve money (i.e., reduced the amount participants were willing to spend on dinner). Also consistent with Study 1 and supporting H2, when goal progress was high, the non-specific debt repayment goal reduced motivation relative the specific goal, but this effect was attenuated at the lower goal progress levels (and even reversed at the lowest level).

Importantly, supporting H3, these effects were driven by the perceived impact of marginal goal progress (i.e., of saving an additional \$25) on the overall debt repayment goal. When participants had a specific (non-specific) goal, accumulating goal progress made marginal goal progress seem more (less) impactful, and these judgments of subjective impact determined

subsequent motivation. Lastly, that we found support for our hypotheses in this controlled realistic goal scenario casts doubt on the possibility that depletion or other differences between the previous study's goal progress conditions might have explained the effects.

2.6 Study 3

Study 3 underscores the findings of Study 2 in a different important goal domain: weight loss. We manipulated the specificity of a weight loss goal, provided participants with goal progress feedback, and then measured motivation and the subjective impact of marginal goal progress (i.e., losing an additional pound) on their overall weight loss goal.

To rule alternative explanations, we made two key adjustments to the study design. First, to ensure that the specific goal is not artificially increasing participants' aspiration level, we set the specific goal level lower than the natural aspiration level. Doing so rules out the possibility that the asymmetry in the goal specificity \times goal progress interaction, which we argue is driven by loss aversion, could be attributed to differences in goal difficulty (i.e., the non-specific goal being less challenging than the specific goal) or perceived goal completion (i.e., non-specific goal pursuers inferring goal completion at higher progress levels). Second, to rule out potential order effects, we measured subjective impact after motivation.

2.6.1 Design and Method

Participants ($N = 229$) were recruited from a university behavioral lab in exchange for course credit. Four individuals declined to participate after reading an eating-disorder trigger warning on the consent page, and ten participants (4%) began the study but did not complete it, leaving a sample of 215 (average age = 25.21 years, 66.5% female). Participants were randomly assigned to one condition in a 2 (goal specificity: specific, non-specific) \times 2 (goal progress: low, high) between-subjects design.

First, we manipulated goal specificity. We asked participants to imagine that they had a goal to lose weight over the next eight weeks. In the specific goal condition, participants reported their current body weight and read that their goal was to “lose 6 pounds over the next 8 weeks” from this starting weight. A pretest conducted with a separate sample from the same population indicated that this goal was just 63% of what people would naturally aim to lose in eight weeks (see appendix A for details). In the non-specific goal condition, participants reported their current body weight and read that their goal was to “lose as much weight as you can over the next 8 weeks” from this starting weight.

Second, we provided goal progress feedback. In the low (high) goal progress condition, participants read that, “near the beginning (end) of the 8 weeks, you’ve lost 1.5 pounds (4.5 pounds) so far. Based on your starting weight of [X] pounds, you would weigh [Y] pounds at this point.” The exact current weight was automatically calculated for each participant based on his or her reported starting weight. A pretest conducted with a separate sample confirmed that in both goal specificity conditions, perceived goal progress increased from 1.5 pounds to 4.5 pounds (see appendix B for details).

Third, we measured motivation. Participants responded to two questions: “How motivated would you be to lose weight at this point?” (1 = *Not motivated at all*, 7 = *Extremely motivated*) and “How hard would you be willing to work to lose weight at this point?” (1 = *Unwilling to work hard*, 7 = *Willing to work very hard*). These items were highly correlated ($r = .79$) and combined.

Finally, we measured the subjective impact of marginal progress. We asked participants, “At this point, how much of an impact would losing the next pound have on your weight loss goal?” (1 = *No impact at all*, 7 = *Very large impact*).

2.6.2 Results

Motivation. A 2 (goal specificity) x 2 (goal progress) ANOVA on motivation revealed only the predicted interaction ($F(1, 211) = 12.49, p = .001$; figure 5). There was no main effect of goal specificity or goal progress (F 's < 1).

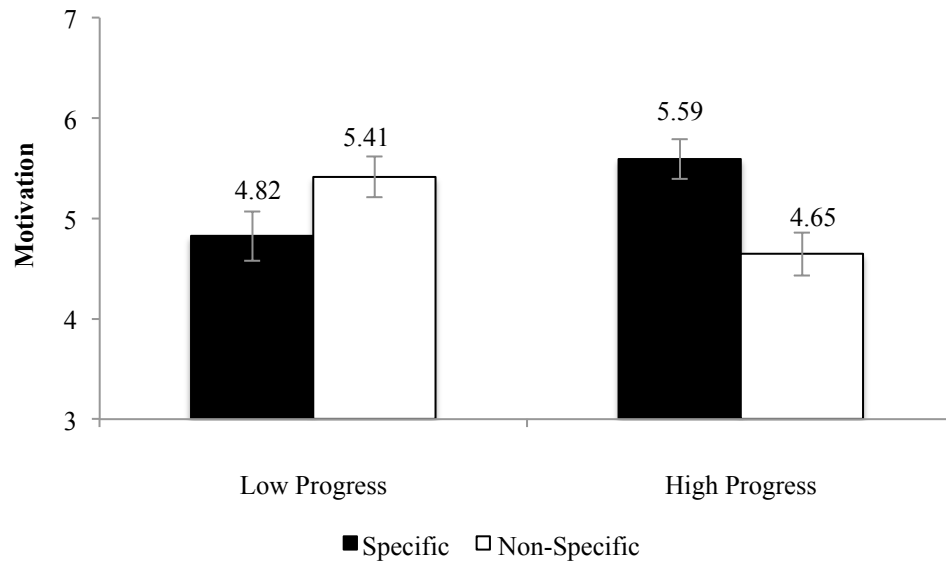


Figure 5. Goal Specificity Affects Motivation to Lose Weight.

Consistent with Studies 1 and 2, in the specific goal condition, accumulating goal progress increased subsequent motivation ($F(1, 211) = 5.90, p = .016$). Specific goal pursuers were more motivated to lose additional weight after losing 4.5 pounds ($M = 5.59$) versus 1.5 pounds so far ($M = 4.82$). Supporting H1, however, in the non-specific goal condition, the opposite occurred ($F(1, 211) = 6.64, p = .011$). Participants were *less* motivated to lose additional weight after losing 4.5 pounds ($M = 4.65$) versus 1.5 pounds so far ($M = 5.41$).

Further, consistent with the previous studies and supporting H2, when goal progress was high, the non-specific (vs. specific) goal reduced motivation ($M_{\text{non-specific}} = 4.65, M_{\text{specific}} = 5.59$;

$F(1, 211) = 9.82, p = .002$). When goal progress was low, however, this effect (marginally) reversed ($M_{\text{non-specific}} = 5.41, M_{\text{specific}} = 4.82; F(1, 211) = 3.56, p = .060$).

Subjective Impact. A 2 (goal specificity) x 2 (goal progress) ANOVA on subjective impact revealed a significant main effect of goal specificity ($M_{\text{non-specific}} = 4.89, M_{\text{specific}} = 5.37; F(1, 211) = 4.69, p = .03$), qualified by the predicted interaction ($F(2, 211) = 12.86, p < .001$). There was no main effect of goal progress ($F < 1$).

Consistent with Study 2, in the specific goal condition, accumulating goal progress increased the subjective impact of marginal goal progress ($F(1, 211) = 4.46, p = .036$). Losing an additional pound was perceived to have a bigger impact when participants had already lost 4.5 pounds ($M = 5.68$) versus 1.5 pounds ($M = 5.06$). As expected, however, in the non-specific goal condition, the opposite occurred ($F(1, 211) = 8.93, p = .003$). Losing an additional pound was perceived to have *less* of an impact when participants had lost 4.5 pounds ($M = 4.52$) versus 1.5 pounds ($M = 5.35$).

Further, also as expected, when goal progress was high, the non-specific (vs. specific) goal reduced the subjective impact of marginal goal progress ($M_{\text{non-specific}} = 4.52, M_{\text{specific}} = 5.68; F(1, 211) = 17.16, p < .001$). When goal progress was low, however, this effect directionally reversed ($M_{\text{non-specific}} = 5.35, M_{\text{specific}} = 5.06; F(1, 211) = .973, p = .325$).

Underlying Process. Like in Study 2, we ran a bias-corrected bootstrapping mediated moderation analysis to examine the underlying process. Results supported H3, revealing a significant index of mediated moderation (index: .91, 95% CI .41 to 1.51]). In the specific goal condition, accumulating goal progress increased motivation to lose weight, driven by seeing marginal goal progress as more impactful ($ab = .39, 95\% \text{ CI } [.05 \text{ to } .79]$). In the non-specific goal condition, however, accumulating goal progress decreased motivation to lose weight, driven by seeing marginal goal progress as less impactful ($ab = -.52, 95\% \text{ CI } [-.92 \text{ to } -.19]$).

2.6.3 Discussion

Study 3 provides further support for our theory in a different goal domain: weight loss. Consistent with the previous studies and supporting H1, when participants had a specific (non-specific) goal to lose weight, accumulating goal progress increased (decreased) subsequent motivation. Consistent with the previous studies and supporting H2, when goal progress was high, the non-specific (vs. specific) goal reduced motivation, but this effect was eliminated (and directionally reversed) when goal progress was low. Finally, consistent with Study 2 and supporting H3, these motivation effects were driven by the perceived impact of marginal goal progress (i.e., losing an additional pound) on the overall weight loss goal. Notably, because the specific goal value was calibrated to be one third lower than participants' natural targets, these results cannot be explained by non-specific goal pursuers being less ambitious or feeling that the higher progress level constituted goal completion.

We have argued that goal specificity alters the relationship between goal progress and motivation because it makes different reference points salient: the end-state for specific goals and the initial-state for non-specific goals. To test the role of reference points more directly, our next two studies (4a and 4b) manipulate the focal reference point for specific goal pursuers—the end-state (as is naturally the case) or the initial-state—and compare their judgments of subjective impact and motivation to non-specific goal pursuers. If a difference in salient reference points underlies goal specificity's effects, as we suggest, then encouraging specific goal pursuers to instead use the initial-state as the reference point should make them appear like non-specific goal pursuers: exhibiting a reverse goal gradient (Study 4a) and reducing motivation relative to specific goal pursuers focused on the end-state at high goal progress (Studies 4a and 4b).

Notably, if manipulating specific goal pursuers' focal reference point attenuates goal specificity's effects, as we expect, this would further rule out potential alternative explanations

due to goal difficulty or goal completion (which rely on unrelated differences between non-specific and specific goals).

2.7 Study 4a

Study 4a directly tests the proposed role of reference point focus in generating goal specificity's effects. Following the paradigm of Study 2, we manipulated the specificity of a debt repayment goal and the current level of goal progress. In addition, in the specific goal condition, we directed some participants to focus on the initial-state as the reference point. We expected that, rather than motivation increasing with accumulated goal progress, motivation would decrease with accumulated goal progress (i.e., a reverse goal gradient) in this case. Further, like non-specific goal pursuers, we expected that specific goal pursuers focused on the initial-state would be less motivated at high (vs. low) goal progress than those in the specific control condition.

2.7.1 Design and Method

Participants ($N = 312$) were recruited from a university behavioral lab in exchange for course credit. Four individuals (1%) reported technical problems and failed to complete the study, leaving a sample of 308 (average age = 22.48 years, 70.5% female). Participants were each randomly assigned to one condition in a 3 (reference point focus: specific control, specific initial-state focus, non-specific) x 2 (goal progress: low, high) between-subjects design. Note that (here and in Study 4b) there was no “non-specific end-state focus” condition, because based on our conceptualization, the end-state reference point does not exist for non-specific goals.

First, we manipulated goal specificity. As in Study 2, we asked participants to imagine they were paying off loans over time. In the two specific goal conditions, participants read that

their goal this month was to “pay off an extra \$500.” In the non-specific goal condition, participants read that their goal this month was to “pay off as much extra as you can.”

Second, we provided goal progress feedback. Participants read that partway through the month, they were planning to go out to dinner with a friend, and that so far this month they had put \$50 (low progress condition) or \$450 (high progress condition) towards their loans.

Third, we manipulated the focal reference point. On the same page as the goal progress feedback, participants viewed a progress bar with a dotted line indicating their current progress level (see appendix C). Following a manipulation used in prior work (Bonezzi et al. 2011; Koo and Fishbach 2012), in the specific initial-state focus condition, we instructed participants to highlight the portion of the progress bar corresponding to their accumulated goal progress (i.e., the area between their current state and the initial-state). This encouraged them to compare their current goal progress to the initial-state (rather than the end-state) reference point. Participants in the specific control and non-specific conditions proceeded directly to the next part of the study.

Fourth, we measured motivation. All participants received information about two potential restaurants for the dinner with their friend: “Restaurant A,” which was described as a restaurant the friend liked with an average cost of \$35 per person for dinner, and “Restaurant B,” which was described as another restaurant the friend liked with an average cost of \$20 per person for dinner. We reasoned that the more motivated participants were to put money toward their debt repayment goal, the more they should prefer Restaurant B (the less expensive option) to Restaurant A. Accordingly, we asked them, “Would you be more likely to choose Restaurant A or the less-expensive Restaurant B?” (1 = *Definitely Restaurant A*, 7 = *Definitely Restaurant B*).

Finally, we measured the subjective impact of marginal goal progress. We asked participants, “At this point, how much of an impact would saving an additional \$15 have on helping you reach your goal for the month?” (1 = *No impact at all*, 7 = *Very large impact*).

2.7.2 Results

Motivation. A 3 (reference point focus) x 2 (goal progress) ANOVA on motivation (i.e., preference for the inexpensive restaurant) revealed only the predicted interaction ($F(2, 302) = 3.46, p = .033$; figure 6). There was no main effect of reference point focus ($F(2, 302) = 2.16, p = .118$) or goal progress condition ($F(1, 302) = 2.54, p = .112$).

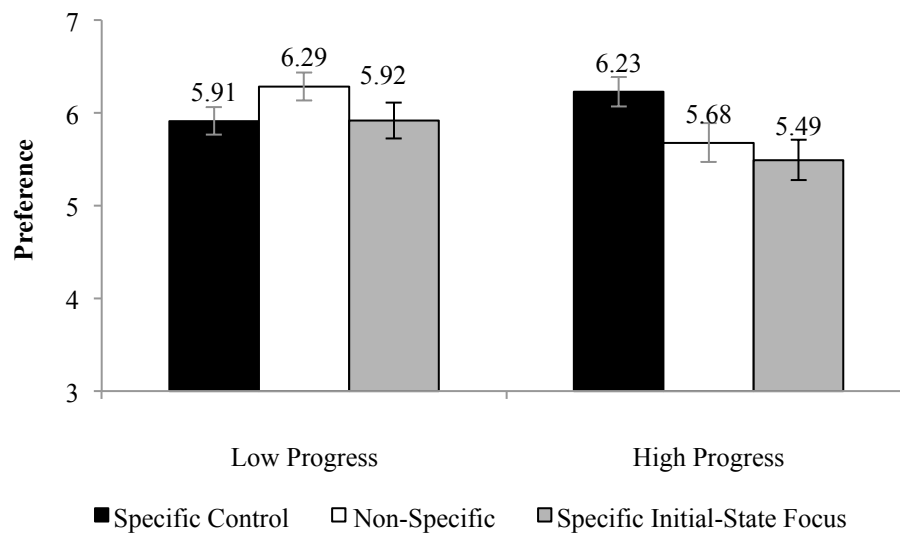


Figure 6. Reference Point Focus Affects Motivation to Pay off Debt. Note that preference for inexpensive option (higher score) corresponds to greater motivation.

Consistent with the prior studies, in the specific control condition, accumulating goal progress (i.e., putting \$50 vs. \$450 towards the loans) increased subsequent preference for the inexpensive restaurant (although the effect was only directional in this case; $M_{\text{low}} = 5.91, M_{\text{high}} = 6.23; F(1, 302) = 1.42, p = .235$). In the non-specific goal condition, however, accumulating goal progress decreased preference for the inexpensive restaurant ($M_{\text{low}} = 6.29, M_{\text{high}} = 5.68; F(1, 302) = 5.41, p = .021$).

Importantly, supporting our theory, in the specific initial-state focus condition, accumulating goal progress also decreased subsequent preference for the inexpensive restaurant (albeit marginally, $F(1, 302) = 2.73, p = .099$). When we encouraged specific goal pursuers to adopt the initial-state as their reference point, as non-specific goal pursuers do naturally, they were *less* motivated to conserve money after putting \$450 ($M = 5.49$) versus \$50 ($M = 5.92$) towards their loans (similar to those in the non-specific goal condition).

Also consistent with the prior studies, when goal progress was high, participants in the non-specific goal condition were less motivated than those in the specific control condition ($M_{\text{non-specific}} = 5.68, M_{\text{specific-control}} = 6.23; F(1, 302) = 4.17, p = .042$). However, supporting our theory, this difference was eliminated when specific goal pursuers were encouraged to focus on the initial-state: motivation was lower ($M = 5.49$) than in the specific control condition ($F(1, 302) = 7.65, p = .006$) and no different from the non-specific goal condition ($F < 1$). When goal progress was low, motivation did not differ between the non-specific goal ($M = 6.29$), specific control ($M = 5.91$), and specific initial-state focus conditions ($M = 5.92$). See table 2 for pairwise contrasts.

Subjective Impact. A 3 (reference point focus) x 2 (goal progress) ANOVA on subjective impact revealed a marginal main effect of reference point focus ($F(2, 302) = 2.73, p = .07$), qualified by the predicted interaction ($F(2, 302) = 8.09, p < .001$). There was no main effect of goal progress ($F < 1$).

Consistent with Studies 2 and 3, in the specific control condition, accumulating goal progress (i.e., putting \$450 vs. \$50 towards the loans) increased the subjective impact of marginal goal progress ($M_{\text{low}} = 4.36, M_{\text{high}} = 5.16; F(1, 302) = 8.33, p = .004$). In the non-specific goal condition, however, accumulating goal progress decreased the subjective impact of marginal goal progress ($M_{\text{low}} = 4.80, M_{\text{high}} = 4.17; F(1, 302) = 5.23, p = .020$).

Importantly, as expected, in the specific initial-state focus condition, accumulating goal progress also decreased the subjective impact of marginal goal progress (albeit marginally, $F(1, 302) = 3.11, p = .080$). When we encouraged specific goal pursuers to adopt the initial-state as their reference point, as non-specific goal pursuers do naturally, saving an additional \$15 was perceived to have *less* of an impact on the overall goal after putting \$450 ($M = 4.07$) versus \$50 ($M = 4.55$) towards their loans (similar to those in the non-specific goal condition).

Also consistent with Studies 2 and 3, when goal progress was high, participants in the non-specific goal condition saw marginal goal progress as more impactful than did those in the specific control condition ($M_{\text{non-specific}} = 4.17, M_{\text{specific-control}} = 5.16; F(1, 302) = 12.32, p = .001$). This difference was eliminated, however, when specific goal pursuers focused on the initial-state as the reference point: subjective impact was lower ($M = 4.07$) than in the specific control condition ($F(1, 302) = 15.11, p < .001$) and no different from the non-specific condition ($F < 1$). When goal progress was low, subjective impact did not differ between the non-specific goal ($M = 4.80$), specific control ($M = 4.36$) and specific initial-state focus conditions ($M = 4.55$). See table 2 for pairwise contrasts.

Underlying Process. Like in the previous studies, we ran a bias-corrected bootstrapping mediated moderation analysis to examine the underlying process. Because we expected (and found) similar effects in the two conditions where the initial-state was salient, these were combined for this analysis (effects are the same if each is separately compared to the specific control condition). Results supported our theory, revealing a significant index of mediated moderation (index: .44, 95% CI [.21 to .76]). In the specific control condition, where participants naturally focused on the end-state as the reference point, accumulating goal progress increased motivation by making marginal goal progress seem more impactful ($ab = .26, 95\% \text{ CI } [.10 \text{ to } .48]$). In the other two conditions, where participants focused on the initial-state as the reference

point, accumulating goal progress *decreased* motivation by making marginal progress seem *less* impactful ($ab = -.18$, 95% CI [-.37 to -.05]).

Further, in the high goal progress condition, focusing on the initial-state (non-specific and specific initial-state focus conditions) was less motivating than focusing on the end-state (specific control), because it made marginal goal progress seem less impactful ($ab = .11$, 95% CI [.06 to .19]). In the low goal progress condition, the indirect effect was not significant ($ab = -.03$, 95% CI [-.09 to .01]).

2.7.3 Discussion

Study 4a provides further insight into the underlying process by directly manipulating the focal reference point. When we encouraged specific goal pursuers to focus on the initial-state as the reference point instead, their motivation (and judgments of subjective impact) no longer increased, but decreased with accumulated goal progress (like their non-specific goal counterparts). Moreover, when current goal progress was high, specific goal pursuers focused on the initial-state were less motivated than those in the specific control condition, like those in the non-specific goal condition. Together these results provide direct evidence for the role of reference points (rather than other potential differences related to goal difficulty or goal completion) in shaping goal specificity's effects.

2.8 Study 4b

Building on Study 4a, Study 4b further explored the role of reference point focus in determining how goal specificity shapes motivation. Following a similar paradigm to Study 3, we manipulated whether specific goal pursuers focused on the initial-state (vs. end-state) reference point. If a difference in salient reference points underlies goal specificity's effects, as our theory

suggests, then encouraging specific goal pursuers to instead use the initial-state as the reference point should attenuate the difference between non-specific and specific goals. We tested this prediction at a high level of goal progress, where goal specificity produces the strongest divergence.

2.8.1 Design and Method

Participants ($N = 192$, average age = 22.95 years, 66.1% female) were recruited from a university behavioral lab in exchange for course credit. All recruited participants completed the study and all were included in the analyses. Participants were randomly assigned to a reference point focus condition: specific end-state focus, specific initial-state focus, or non-specific.

First, we manipulated goal specificity. Similar to Study 3, in the two specific goal conditions, participants reported their current body weight and read that their goal was to “lose six pounds” from this starting weight. In the non-specific goal condition, participants reported their current body weight and read that their goal was to “lose as much weight as you can” from this starting weight.

Second, we provided high goal progress feedback. All participants read that a few weeks later, they weighed themselves again, and their current weight was five pounds less than their starting weight. The exact current weight value was automatically calculated for each participant based on his or her reported starting weight.

Third, we manipulated the focal reference point. Similar to Study 4a, participants viewed a progress bar (on a sheet of loose paper) with a dotted line indicating their current level of goal progress and an arrow either pointing left (toward the initial-state) or right (toward the end-state) (see appendix D). In the specific end-state focus condition, the arrow pointed to the right. In the

specific initial-state focus and non-specific conditions, the arrow pointed to the left. All participants were instructed to shade in the progress bar with a pencil, starting from the dotted line in the direction of the arrow. This encouraged them to compare their current goal progress to either the initial-state or end-state, depending on condition.

Fourth, we measured the subjective impact of marginal goal progress. We asked participants, “At this point, how much would losing an additional pound impact your weight loss goal?” (1 = *No impact at all*, 7 = *Very large impact*).

Finally, we measured motivation. Participants answered the same two questions from Study 4a, which we combined ($r = .79$).

2.8.2 Results

Motivation. A one-way ANOVA on motivation revealed a significant effect ($F(2, 189) = 6.87, p = .001$). Consistent with Study 4a and supporting our theory, at this high level of goal progress, participants in the non-specific goal condition were less motivated than those in the specific end-state focus condition ($M_{\text{non-specific}} = 4.21, M_{\text{specific end-state}} = 5.20; F(1, 189) = 10.89, p = .001$). This difference was eliminated, however, when specific goal pursuers were encouraged to focus on the initial-state instead ($M = 4.29$; vs. the specific end-state focus condition: $F(1, 189) = 9.67, p = .002$; vs. the non-specific goal condition: $F < 1$).

Subjective Impact. A one-way ANOVA on the subjective impact of marginal goal progress also revealed a significant effect ($F(2, 189) = 2.99, p = .053$). Consistent with Study 4a and supporting our theory, at this high level of goal progress, subjective impact was lower in the non-specific versus the specific end-state focus condition ($M_{\text{non-specific}} = 3.97, M_{\text{specific}} = 4.59; F(1, 189) = 3.25, p = .073$), but this difference was eliminated in the specific initial-state focus condition ($M = 3.81$; the specific end-state focus condition: $F(1, 189) = 5.42, p = .021$; the non-specific condition: $F < 1$).

Table 2. Pairwise Contrasts Between Reference Point Focus Conditions.

Study, Progress (DV)		Specific Control vs. Non-Specific	Specific Control vs. Specific Initial-State Focus	Non-Specific vs. Specific Initial-State Focus
4a, High (Preference)	<i>F</i> (1, 302)	4.17**	7.65***	.55
	<i>p</i>	.042	.006	.458
4a, High (Impact)	<i>F</i> (1, 302)	12.32***	15.11***	.13
	<i>p</i>	.001	< .001	.715
4a, Low (Preference)	<i>F</i> (1, 302)	2.12	< .001	1.91
	<i>p</i>	.146	.986	.168
4a, Low (Impact)	<i>F</i> (1, 302)	2.62	.50	.77
	<i>p</i>	.107	.481	.381
4b, High (Motivation)	<i>F</i> (1, 189)	10.89***	9.67***	.09
	<i>p</i>	.001	.002	.771
4b, High (Impact)	<i>F</i> (1, 189)	3.25*	5.42**	.21
	<i>p</i>	.073	.021	.646

Note—Pairwise contrasts in each reference point focus condition of Studies 4a-b: specific control vs. non-specific, specific control vs. specific initial-state focus, non-specific vs. specific initial-state focus. As expected, in the high goal progress condition, the specific control contrasts emerged as significant in each case, whereas the non-specific vs. specific initial-state focus contrast did not. * $p < .10$, ** $p < .05$, *** $p < .01$

Underlying Process. Similar to the previous studies, we ran a bias-corrected bootstrapping mediation analysis to examine the underlying process. Because we expected (and found) no difference between the two conditions where the initial-state was salient, these were combined for this analysis (effects are the same if each is separately compared to the specific end-state focus condition). Results supported our reasoning: at this high level of goal progress, focusing on the initial-state—regardless of whether the goal was non-specific or specific—was less motivating than focusing on the end-state, because it made marginal goal progress seem less impactful ($ab = .13$, 95% CI [.02 to .24]).

2.8.3 Discussion

Study 4b underscores the role of reference points in shaping goal specificity's effects. When focused on the naturally more salient reference point (end-state for specific goals and initial-state for non-specific goals), the non-specific goal reduced subjective impact and motivation relative to the specific goal. When specific goal pursuers were directed to focus on the initial-state as the reference point instead, however, this effect was attenuated. These findings support our theory that goal specificity alters what reference point consumers spontaneously adopt during goal pursuit, and this difference in focal reference points underlies the documented effects of goal specificity on subsequent motivation.

2.9 General Discussion

Non-specific goals are both common and important in consumers' lives. Yet despite considerable interest in the consequences of setting non-specific (vs. specific) goals (e.g., Locke et al. 1989; Locke and Latham 1990; Naylor and Ilgen 1984; Soman and Cheema 2004; Ülkümen and Cheema 2011; Wright and Kacmar 1994), understanding of how goal specificity shapes motivation during goal pursuit is more limited. To provide deeper insight into goal specificity's effects, the current research developed a series of hypotheses that describe how goal specificity and goal progress jointly influence subsequent motivation.

Our central proposition is that goal specificity alters what reference point consumers adopt during goal pursuit: for specific goals, the goal objective or specific end-state serves as the focal reference point, but for non-specific goals, which lack a specific end-state, the initial-state serves as the focal reference point. We argued that this difference in focal reference points has important consequences for (1) how accumulating goal progress shapes motivation to pursue non-

specific (vs. specific) goals, and (2) when (i.e., at what level of goal progress) non-specific goals reduce (or increase) motivation relative to specific goals.

Five studies supported our hypotheses. Across a variety of goal domains (task performance, debt repayment, weight loss), paradigms (lab tasks and realistic goal scenarios), and measures of motivation, consistent results emerged. First, for specific goals, accumulating goal progress increases subsequent motivation, but for non-specific goals, accumulating goal progress decreases subsequent motivation (Studies 1-4a, H1). Second, non-specific (vs. specific) goals are less motivating at higher levels of goal progress (Studies 1-4b, H2), but this difference is attenuated (and in some cases reversed) at lower levels of goal progress (Studies 1-4a, H2). Third, the subjective impact of marginal goal progress, which is determined by the shape of the value function, drives these effects (Studies 2-4b; H3).

Our final two studies provided direct evidence for the role of reference points by manipulating whether specific goal pursuers focused on the initial-state. When specific goal pursuers were encouraged to adopt the initial-state as their reference point (as non-specific goal pursuers do naturally), their motivation decreased with accumulated goal progress (Study 4a) and they were no longer more motivated than non-specific goal pursuers when current goal progress was high (Studies 4a and 4b). These findings underscore that goal specificity's effects rely on natural differences in reference point focus.

Notably, our findings support the proposed roles of both diminishing sensitivity and loss aversion in determining how goal specificity shapes motivation. That the subjective impact of marginal goal progress (and motivation) decreased (increased) with accumulated goal progress for non-specific (specific) goals underscores that proximity to one's salient reference point influences motivation (diminishing sensitivity). Moreover, that goal specificity produced a greater effect on subjective impact and motivation at higher (vs. lower) goal progress levels underscores

that whether one is below or above the salient reference point and (thus in losses or gains) influences motivation (loss aversion).

Further support for the role of loss aversion comes from examining the intermediate level of goal progress. Based on our theory, when consumers' current level of goal progress is equidistant from the initial-state and end-state reference points, non-specific goals should tend to reduce motivation relative to specific goals. Because distance from the focal reference point is held constant, loss aversion, rather than diminishing sensitivity, should be the sole determinant of the subjective impact of marginal goal progress, and non-specific (specific) goals should put people in losses (gains). A single-paper meta-analysis (McShane and Böckenholt 2017) on the intermediate progress level conditions of Studies 1 and 2 supported this reasoning. When non-specific and specific goal pursuers were equally far from their respective reference points, specific goal pursuers showed greater motivation (contrast = 0.23, SE = .11, $p = .035$).² These results bolster empirical support for the proposed role of loss aversion in determining how goal specificity shapes motivation.

2.9.1 Theoretical Contributions

This research makes three main theoretical contributions. First, our findings inform the relationship between goal progress and motivation. A large body of research demonstrates that accumulating goal progress increases subsequent motivation (e.g., the “goal gradient” or “goal-looms-larger” effect; Hull 1932; Kivetz et al. 2006; Louro et. al 2007; Nunes and Drèze 2011; Soman and Shi 2003). More recently, a few articles have suggested that accumulating goal

² This analysis uses the focal measures of motivation in each study (persistence in Study 1 and WTP in study 2, both log-transformed). Due to the reversed coding in Study 2 (i.e., lower WTP indicates higher motivation), cell means in that study were reflected around the grand mean. If we instead use the Study 2 subjective impact measure, to avoid reverse coding, the focal effect is even stronger (contrast = 0.47, SE = .18, $p = .011$).

progress can both increase and decrease subsequent motivation, depending on whether the starting point (i.e., initial-state) or ending point (i.e., end-state) is salient (e.g., the “stuck in the middle” effect or “small area hypothesis”; Bonezzi et al. 2011; Carton et al. 2011; Koo and Fishbach 2012; Touré-Tillery and Fishbach 2012). Building on these findings, our research identifies goal specificity as a key determinant of the relationship between goal progress and motivation. By influencing what reference point consumers naturally adopt, goal specificity determines whether accumulating goal progress increases or decreases subsequent motivation.

Second, this research advances understanding of how goal specificity shapes motivation. Goal specificity is known to influence many aspects of goal pursuit, including goal commitment and performance (e.g., Locke et al. 1989; Naylor and Ilgen 1984; Soman and Cheema 2004; Ülkümen and Cheema 2011; Wright and Kacmar 1994). Prior research has explained these effects by noting that non-specific goals introduce ambiguity into how performance is evaluated (e.g., Locke and Latham 1990; Wright and Kacmar 1994). Yet while this reasoning is consistent with the previously documented effects, it provides limited ability to predict how motivated consumers will be at specific points *during* goal pursuit (i.e., having accumulated different amounts of goal progress). The current research proposes that, beyond simply making performance evaluation more ambiguous, goal specificity fundamentally changes what reference point consumers adopt during goal pursuit, and that this difference in focal reference points determines how accumulating goal progress affects subsequent motivation.

In addition, the current work informs previously documented advantages and disadvantages of specific goals relative to non-specific goals. For example, prior work finds that setting specific (vs. non-specific) goals tends to lead to better performance outcomes (Locke and Latham 1990; Locke et al. 1981). Consistent with this, we also find a performance advantage of specific goals relative to non-specific goals, but show that this occurs primarily at higher levels of

goal progress. Prior work also demonstrates that specific goals can exhibit a “starting problem,” such that goal pursuers are reluctant to take initial steps towards very distant goals (Heath et al. 1999), but non-specific goals, which lack a specific end-state, show this less. Consistent with this, we also find that specific (vs. non-specific) goals can be disadvantageous at lower progress levels, because the value function is less steep.

Third, this research generalizes the theory of goals-as-reference points beyond goals that have specific performance objectives. Since the seminal article introducing this framework (Heath et al. 1999), research has explored its consequences for decision-making (Larrick et al. 2009; Medvec and Savitsky 1997) and behavior (Allen et al. 2016; Berger and Pope 2011; Bonezzi et al. 2011; Kivetz et al. 2006; Medvec, Madey, and Gilovich 1995; Pope and Simonsohn 2011), but focused less on further developing the theory. The current work contributes in two important ways: (1) by identifying goal specificity as a key determinant of what reference point consumers spontaneously rely on to evaluate their current goal progress, and (2) by specifying implications of both diminishing sensitivity and loss aversion for goal pursuers focused on a goal’s initial-state (vs. end-state) as the reference point.

Notably, our work is also the first to empirically show that the subjective impact of marginal goal progress, determined by the shape of the value function, drives the effects of reference point focus on subsequent motivation. Prior work has speculated about this underlying process (e.g., Bonezzi et al. 2011; Heath et al. 1999; Kivetz et al. 2006; Koo and Fishbach 2012), but only measured its downstream effects on motivation and behavior. By eliciting explicit judgments of the subjective impact of marginal goal progress, the present studies provide direct support for its role in predicting motivation.

2.9.2 Practical Implications

The findings also have practical implications. For consumers, our work suggests that setting specific goals can lead to greater motivation (e.g., Locke et al. 1989; Locke and Latham 1990)—but might not always. Early on in the pursuit of a specific goal, when reaching the goal objective is far off, focusing on the end-state as the reference point may prove less motivating than focusing on the initial-state. This may put specific goals at a disadvantage when consumers' current level of goal progress is relatively low (e.g., after losing just a couple of pounds or repaying a small portion of a loan). Indeed, in our studies that examined lower levels of goal progress, the non-specific goal was (at least directionally) more motivating than the specific goal in each case. Particularly for challenging specific goals, which have end-states further from the initial-state, consumers could thus benefit from deliberately adopting the initial-state as the reference point early on or by breaking up their overall goal into smaller sub-goals (Fishbach, Dhar, and Zhang 2006; Heath et al. 1999).

For marketers, our findings suggest that effective strategies for motivating consumers to pursue specific goals may be ineffective or even harmful for non-specific goals. Whereas marketers can encourage consumers to work toward specific goals (e.g., loyalty program rewards, product collections) by emphasizing earned progress or endowing un-earned progress (Nunes and Drèze 2006; Kivetz et al. 2006; Zhang and Huang 2010), these strategies may backfire for non-specific goals. For both individual non-specific goals (e.g., reward programs) and group non-specific goals (e.g., fundraising drives, petitions), perceiving greater goal progress may undermine motivation by making subsequent actions seem less impactful. Marketers may be able to overcome this demotivating effect by directly bolstering the subjective impact of marginal progress or by encouraging consumers to compare their current progress to external reference points (e.g., social comparisons, prior performance) rather than where they started.

2.9.3 Future Research Directions

This work suggests several interesting opportunities for future research. One is to investigate the effects of range goals (e.g., lose 10-15 pounds) on motivation. In past research, range goals have been treated as an intermediate level of goal specificity, falling between purely specific goals and non-specific “do-your-best” goals (Locke et al. 1989; Naylor and Ilgen 1984; Scott and Nowlis 2013). However, from a reference-points perspective, range goals differ from these goal types in that they contain two potential end-state reference points, as opposed to just one for specific goals and none for non-specific goals. Future work could consider how consumers utilize the additional end-state reference point provided by range goals and explore its consequences for motivation.

Another opportunity for further research is to more deeply explore other aspects of goal specificity. Implicit in the current theorizing is that goals provide a specific initial-state that can be used as a reference point in the absence of an end-state. Yet consumers can also pursue goals that have neither a specific initial-state nor a specific end-state, such as goals to “get in shape” or “get rich.” When pursuing such goals, consumers may draw potential reference points from alternative sources like round numbers (Pope and Simonsohn 2011) or resource constraints (March and Shapira 1992; Spiller 2011). Future research could further explore alternative sources of reference points during goal pursuit, as well as factors that affect how consumers direct their attention when multiple potential reference points are available.

Finally, future work may wish to consider the role of goal difficulty more explicitly. To facilitate fair comparisons between non-specific and specific goals, our studies used specific goals set at or below consumers’ natural aspiration level (see appendix A). How non-specific goals compare to more challenging specific goals could also be interesting to test. Based on our theory, we expect that setting specific goals further from the starting point will exacerbate the

effects of goal specificity: compared to the effects shown here, higher specific goals should more strongly enhance (reduce) motivation when goal progress is high (low). By exploring these and related phenomena, future research could build on our findings to further understanding of how goal specificity and salient reference points shape consumer motivation.

3. Essay 2: “Range Goals as Dual Reference Points”

Reference points exert a powerful influence on judgments and behavior. People tend not to evaluate outcomes in absolute terms, but in relation to a standard or target. For example, at the end of a marathon, runners’ satisfaction with their performance may show little correspondence to their objective finishing times. Instead, each runner tends to evaluate his or her performance by comparing it to his or her personal goal for the race (Allen et al. 2016). Thus a runner who finished in four hours may be delighted at outperforming his reference point, while another runner who finished an hour faster is frustrated at falling short of his. Similarly, students taking the SAT often compare their scores to round-number thresholds (Pope and Simonsohn 2011) and chess players compare their player ratings to their historic personal best (Anderson and Green 2017). In each of these examples, from athletics to academics to chess, outcome satisfaction and other key judgments are at least as dependent on the reference point as on the objective outcome. It is thus critically important to understand what potential reference points are available in a given context and how individuals will ultimately use them.

One of the most prominent sources of reference points is people’s goals. As illustrated by the marathoners described above, a goal’s end-state objective will often become the primary reference point goal pursuers use to evaluate performance and make other goal-related judgments (Heath, Larrick, and Wu 1999). For example, a Fitbit user who aims to walk 10,000 steps in a day will monitor his progress and evaluate his eventual performance by comparing it to that 10,000-step reference point. This reference point will influence how satisfied he is with walking 9,500 or 10,500 steps, how motivated he is to get in another thousand steps after walking 9,500 so far, and ultimately how many steps he ends up walking (Heath et al. 1999).

Many of the goals people pursue do not offer a single end-state objective to serve as a clear reference point. Some goals lack a specific end-state entirely, such as a goal to lose as much

weight as possible. Recent research has examined these nonspecific goals, finding that goal pursuers tend to fall back on their starting point as a reference point when specific goal objectives are not available (Wallace and Etkin 2018). Rather than offering no end-state reference point, other goals instead highlight multiple end-states that could each serve as a reference point. This is the case for a range goal defined by two endpoints (Scott and Nowlis 2013), a debt repayment goal that includes several individual accounts that act as subgoals (Gal and McShane 2012; Kettle et al. 2016), or a goal that has both a primary target and an “emergency reserve” (Sharif and Shu 2017).

When a goal offers multiple end-states as potential reference points, intriguing new questions arise. How do goal pursuers use these multiple reference points? Does one dominate, or do goal pursuers somehow use multiple reference points – and if so, how? Lastly, what implications do goal pursuers’ reference-point strategies have for goal-oriented behavior and performance outcomes?

The present research explores these questions, identifying how goal pursuers use multiple reference points and what that means for subsequent performance. We focus on understanding this phenomenon in the context of range goals, such as a goal to lose 10-15 pounds. This setting enables us to address broad questions of how multiple reference points influence behavior, while also offering novel insight into the effects of range goals and their value as a motivational tool.

This work makes three key contributions. First, it extends current understanding of how multiple reference points influence behavior. By examining how individuals use competing reference points in the context of goal pursuit, this work sheds new light on behavior in real-world contexts where multiple reference points are often available. Second, this work extends the theory of goals as reference points to incorporate range goals. This contributes to both the literature on goals as reference points, which has largely been limited to specific goals (Wallace

and Etkin 2018), and the literature on goal setting and range goals, which has previously been examined in terms of specificity versus ambiguity rather than salient reference points (Wright and Kacmar 1994). Third, building on this extension of theory, the present work contributes to understanding of how range goals influence goal pursuit and performance. By examining range goals as dual reference points, our findings reveal a novel way in which range goals can produce better performance outcomes than specific goals, which are largely considered the gold standard of effective goal setting.

3.1 Reference Points and the Role of Goals

Reference points have powerful and systematic effects on behavior. Rather than evaluating outcomes in an absolute way, people rely on comparisons to their reference point, which defines the boundary between perceived gains and losses. In many cases these reference points come from individuals' personal goals (Heath et al. 1999). For example, an athlete with a goal of doing 50 pushups will see 48 total pushups as a loss or failure and 52 as a gain, despite these being extremely similar accomplishments in absolute terms. This reference point of 50 pushups will determine not only how satisfied the athlete is with his performance, but also how motivated he is to do additional pushups based on his current progress. The larger the subjective impact of the next increment of progress – say, moving from 48 to 49 pushups – the more motivated a goal pursuer will be (Heath et al. 1999).

The nature of reference points' influence on judgments and behavior is described by Prospect Theory's value function (Kahneman and Tversky 1979). Aside from defining the boundary between gains and losses, the value function has two key features that shape behavior: loss aversion and diminishing sensitivity. Loss aversion makes the pain of falling on the loss side of the value function greater than the pleasure of a gain of equal magnitude. Thus the slope of the

value function is steeper on the loss side than on the gain side. Diminishing sensitivity makes the subjective difference between two outcomes greater when those outcomes fall near the reference point (e.g., 48 vs. 49 pushups) than when they are further away (38 vs. 39 pushups). Thus the slope of the value function is steeper near the reference point than far from it.

Critically for the present investigation, goal pursuers are more motivated when they are on a steeper part of the value function (Allen et al. 2016; Heath et al. 1999; Wallace and Etkin 2018; Wu et al. 2008). This is the mechanism by which the theory of goals as reference points explains many behavioral consequences of goals. For example, loss aversion makes goal pursuers highly motivated to reach a goal and much less motivated to continue past it, causing performance outcomes to cluster or “pile up” just above the goal objective (Allen et al. 2016). Similarly, diminishing sensitivity makes goal pursuers more motivated as they accumulate progress and move closer to the goal objective, producing the powerful and well-documented “goal gradient” effect (Hull 1932; Kivetz, Urminsky, and Zheng 2006; Nunes and Drèze 2006; Wallace and Etkin 2018). This same mechanism also predicts the motivational “starting problem,” whereby focusing on a distant goal objective undermines motivation to make initial steps of goal progress (Heath et al. 1999).

Due to the far-reaching effects of these two features of the value function, understanding the role of a goal’s objective as a reference point has shed valuable light on many aspects of goal-related behaviors. However, not all goals have a specific goal objective to serve as a clear reference point. Recent research has begun to address this limitation of the theory of goals as reference points, examining the case of nonspecific or do-your-best goals, which offer no end-state reference point at all (Wallace and Etkin 2018). Likewise, there are also many goals that provide more than one potential reference point. For example, a dieter might set himself a range goal to lose 10-15 pounds. These contexts with multiple competing reference points are the focus

of the present investigation. What will the reference point be while pursuing such a goal, and what does that tell us about resulting motivation and performance?

3.2 Effects of Multiple Reference Points

In many behavioral contexts, individuals have more than one potential reference point available to them. Given the numerous consequences of reference points, this raises important and interesting questions for understanding behavior. How do individuals use these competing reference points? Do people prioritize among the alternatives, integrate them to form a single dominant reference point, or perhaps have some strategy for attending to more than one reference point? And however the various reference points are used, what are the implications for motivation and behavior? By tackling these key questions, we can shed new light on the role of reference points in judgments and behavior.

Prior research points to three general possibilities for how multiple reference points might affect judgments and behavior. We will refer to these as selection, combination, and switching strategies. The first type of strategy, selection, occurs when multiple potential reference points are salient but the individual exclusively attends to one. This strategy is reflected in various streams of research showing a strong effect of one reference point in contexts where other, weaker reference points are also salient. For example, research on goals as reference points and the goal gradient shows the dominance of the goal objective as the reference point (Heath et al. 2006; Hull 1932; Kivetz et al. 2006) despite the availability of other potential reference points such as round numbers (Pope and Simonsohn 2011) or the starting point of goal pursuit (Koo and Fishbach 2012; Wallace and Etkin 2018).

A second way to use multiple reference points is a combination strategy. Prior research points to several contexts where individuals tend to combine potential reference points, such as

by averaging them, in order to arrive at a unified reference point that may or may not match any of the original values (Baucells et al. 2011; Winer 1986). For example, when evaluating a product's price, a consumer will often average together previous prices of that product to form a reference price (Winer 1986). This response predominates in settings where the reference points come from prior outcomes and can thus serve as data points to form expectations about the future.

A third way to use multiple reference points is a switching strategy. This involves using multiple reference points by focusing on one at a time but also shifting that focus based on dynamic factors. The most prominent factor driving this behavior in the literature is proximity: individuals often focus on whichever reference point is currently closest to them (Amir and Ariely 2008; Bonezzi et al. 2011; March and Shapira 1992). Individuals show this type of switching when they evaluate current resource levels using the “survival point” and the “aspirational level” of resources as reference points (March and Shapira 1992). In making these judgments, attention shifts between the two reference points over time based on current proximity to each. Similarly, research on the influence of subgoals has found that individuals adopt the most proximal subgoal as their reference point and thus shift their attention repeatedly during the course of pursuing the overall goal (Amir and Ariely 2008; Huang et al. 2017). In addition to proximity, research suggests reference point focus can also be driven by a directional preference. This is particularly evident in motivational contexts, where more-motivating upward comparisons predominate, such as among students who systematically tend to compare themselves to classmates performing slightly better (vs. slightly worse) than them (Huguet et al. 2001). This directional preference works alongside proximity-based effects in shaping switching behavior, such as when completing a subgoal changes it from a forward- to a backward-looking point of comparison. The present research draws on these strategies for multiple reference points in

related literatures to explore the effects of goals that offer multiple salient reference points, with a particular emphasis on the case of range goals.

3.3 Range Goals as Dual Reference Points

Range goals are a prominent and interesting case of multiple reference points. A range goal is a goal that, instead of specifying one end-state objective, defines the desired outcome as falling between two endpoints. For example, a dieter may aim to lose 10-15 pounds or a worker may aim to save 25-30% of his income this year. These goals present their endpoints simply and directly, with less elaboration or imposed meaning than other goals involving multiple values (e.g., subgoals, Huang et al. 2017; emergency reserves, Sharif and Shu 2017). The goal is easily expressed and neither endpoint is explicitly emphasized over the other, making range goals an ideal setting to examine the effects of two competing goal-based reference points. So how do range goals influence behavior?

Prior work examining the effects of range goals has largely considered ranges as an intermediate level of specificity, falling between specific goals and nonspecific or do-your-best goals (Locke et al. 1989; Locke and Latham 2002; Naylor and Ilgen 1984; Wright and Kacmar 1994). From this perspective, range goals are at best a compromise option, offering a loosely defined objective without the clarity and precision of a specific goal. This stream of research generally favors specific goals as the gold standard, offering better performance outcomes than either range or nonspecific goals (Locke and Latham 2002; Wright and Kacmar 1994). In contrast, we approach range goals from the perspective of understanding goals as reference points. From this perspective, rather than an ambiguous goal objective, range goals actually offer two salient reference points compared to the single end-state of a specific goal. This approach promises to shed light on important and novel aspects of range goal pursuit. Just as a reference-

point framework offered new insight into the performance effects of specific goals (Allen et al. 2016; Heath et al. 1999; Wu et al. 2008), it can provide similar insight into the nature and influence of range goals.

The first question in applying the goals-as-reference points framework to range goals is whether the endpoints of a range goal serve as reference points. One possibility is that, because neither endpoint is established as a clear goal objective comparable to a specific goal, neither is ultimately adopted as a reference point. This would be consistent with the prior literature on range goals, which has largely focused on their “ambiguity or diffuseness” and the fact that they do not clearly define a desired level of performance like specific goals do (Locke and Latham 2002; Wright and Kacmar 1994). If this were the case, we might expect range goal pursuers to primarily compare themselves to the initial-state reference point, just as people do when pursuing nonspecific or do-your-best goals (Wallace and Etkin 2018). Another possibility is that a range goal is actually interpreted as a confidence interval around the midpoint, which is the implicit target and thus becomes the reference point. Again, this would be consistent with the prior literature on range goals, which views range goals as comparable to specific goals set at the midpoint of the range and has found that average performance often falls near the midpoint (Naylor and Ilgen 1984; Scott and Nowlis 2013; Wright and Kacmar 1994).

In contrast to either of these possibilities, we predict that the range’s endpoints will serve as reference points during goal pursuit. This prediction draws on prior research showing the importance of salience in determining reference points (Bonezzi et al. 2011; Pope and Simonsohn 2011; Wallace and Etkin 2018). In particular, this prior work shows that salient but meaningless values such as round numbers are often adopted as reference points (Pope and Simonsohn 2011) and that an otherwise dominated reference point (e.g., the initial-state when a specific goal objective is available) can become the dominant reference point when environmental cues make it

especially salient (Bonezzi et al. 2011; Wallace and Etkin 2018). In the case of range goals, the two range endpoints (e.g., 10 and 15 for a goal of 10-15) are explicitly highlighted in defining the goal. This makes range goals distinct from both nonspecific goals, which do not explicitly highlight any potential end-states, and goals set at the range's midpoint, which makes that value explicitly salient whereas the range does not. Thus during the pursuit of a range goal we predict that the two endpoints will act as reference points.

This brings us to a second key question, how do goal pursuers use the two reference points a range goal offers? Building on the general approaches outlined above for using multiple reference points, we predict three main strategies for range goal pursuit: select-lower, select-upper, and switching. The first two reflect a selection approach whereby one of the available reference points is simply prioritized over the other. In the context of range goals, we propose that both endpoints are viable candidates for selection. Prior research shows that neither endpoint of a range is universally dominant, as each serves a valuable purpose and provides distinct information (Ames and Mason 2015; Scott and Nowlis 2013). For range goal pursuers, the upper endpoint of the range provides an ideal or maximal goal and indicates the potential value of the goal, whereas the lower endpoint provides a minimal goal and indicates the attainability of the goal (Scott and Nowlis 2013). Based on these different functions, both endpoints are potentially important to goal pursuers and may have powerful effects on motivation (Atkinson 1957; Brendl and Higgins 1996; Oettingen et al. 2004). Depending on the goal pursuer's current needs or mindset, though, it is quite possible that one endpoint and its associated meanings will be prioritized over the other (Ames and Mason 2015; Huang et al. 2017; Liberman and Förster 2008; Zhang and Huang 2010). We thus predict that range goal pursuers may use either select-upper or select-lower strategies based on individual and situational factors.

The third strategy we predict for range goal pursuit is a switching strategy. As outlined above, switching involves focusing on one reference point at a time but shifting that focus dynamically over the course of goal pursuit. Based on the factors that typically drive this switching (i.e., proximity and direction), we expect switching in the context of range goals to consist of initially focusing on the lower endpoint of the range and then, after reaching it, switching focus to the upper endpoint for the remainder of goal pursuit. This is distinct from any possible change in focus that might result from other factors such as learning during goal pursuit. A learning-based shift in focus could go in either direction (i.e., lower-to-upper or upper-to-lower) for a given individual, could happen at any point during goal pursuit, and should be most common early on as goal pursuers familiarize themselves with the task (vs. upon reaching the lower end of the range as we predict). We expect that such patterns of reference point switching will be far less common than the particular strategy we've defined based on the reference points literature.

3.4 Consequences for Motivation

Prior research on goals as reference points suggests that these different reference point strategies for range goal pursuit will have substantial effects on motivation (Allen et al. 2016; Bonezzi et al. 2011; Heath et al. 1999; Wallace and Etkin 2018). For the select-upper and select-lower strategies, these effects should be straightforward. In each case, range goal pursuers will be focused on a single end-state reference point just as they would be when pursuing a specific goal, so their motivation and performance should be similar to those with an equivalent specific goal. For example, among a group of dieters each aiming to lose 10-15 pounds, those using a select-upper strategy should perform as if they had a specific goal to lose 15 pounds while those using a select-lower strategy should perform as if they had a specific goal to lose 10 pounds. The select-

upper group should thus perform better on average (i.e., lose more weight), just as specific goal pursuers with a higher goal typically perform better than those with a lower goal (Heath et al. 1999).

The switching strategy presents a more interesting case where range goal pursuers are influenced by two separate end-state reference points in a way that specific goal pursuers cannot be. But will this influence enhance or undermine performance? Drawing on the theory of goals as reference points as well as prior work examining the effects of goals with multiple end-state reference points (e.g., subgoals, Huang et al. 2017; emergency reserves, Sharif and Shu 2017), we propose that the switching strategy will enhance motivation and performance. The key to this prediction is the role of diminishing sensitivity, which makes goal pursuers more motivated when they are near the reference point than when they are further away (Heath et al. 1999; Kivetz et al. 2006; Nunes and Drèze 2006). This increase in motivation is driven by being on a steeper part of the value function, which increases the subjective impact of each marginal step of progress (Heath et al. 1999; Wallace and Etkin 2018). Compared to a specific goal or a select-upper strategy, a switching strategy offers the same ultimate target (i.e., the upper endpoint of the range) while also taking advantage of an intermediate reference point (i.e., the lower endpoint). Using this intermediate reference point keeps goal pursuers closer to their salient reference point and thus on a steeper, more motivating part of the value function over the course of goal pursuit. This benefit comes particularly in the portion of goal pursuit leading up to the lower endpoint of the range, when switchers are focused on that intermediate reference point and specific (or select-upper) goal pursuers are focused on the more distant upper endpoint. Notably, this timing is distinct from that of possible competing explanations such as an increase in self-efficacy or feelings of commitment for switchers after they reach the intermediate reference point (Drèze and Nunes 2011; Fishbach, Dhar, and Zhang 2006; Gal and McShane 2012).

Based on this line of reasoning, we predict that a switching strategy for range goals will lead to better performance than either a select-upper strategy or an equivalent specific goal. We will test this prediction in a goal-pursuit context with naturally self-selected strategies and then, to provide stronger causal evidence, in a context where strategies are experimentally assigned and manipulated. In addition to this test of performance, we further predict that any differences in performance will be driven by an increase in the subjective impact of marginal progress over the course of goal pursuit, particularly the portion of goal pursuit where reference point focus differs (i.e., prior to reaching the lower endpoint of the range). We will experimentally test this prediction as well, shedding light on the underlying psychological process.

The paper proceeds as follows. First, studies 1 and 2 empirically test our predictions about range goals' endpoints as dual reference points and goal pursuers' strategies for using those reference points. Study 2 also provides an initial look at consequences for performance, although it cannot offer strong causal evidence due to self-selection. Next, study 3 experimentally manipulates strategy selection in order to directly test the causal effect of range goal strategies on performance. Finally, study 4 replicates this main test while also measuring the subjective impact of marginal progress during goal pursuit in order to offer insight into the proposed underlying process. Lastly, we conclude with a review of our findings' contributions to theory, their practical implications, and fruitful opportunities for further research in this area.

3.5 Study 1

Study 1 offers an initial look at whether one or both of a range goal's endpoints serve as reference points during goal pursuit, as the goal objective does for specific goals (Heath et al. 1999). In this study, we examined the effect of a range goal's dual reference points by assessing the clustering of scores at these values in an effortful laboratory task. Prior research shows that

the shape of the value function leads to a high concentration of performance outcomes just above a reference point and low concentration just below it (Heath et al. 1999). This clustering of performance is a key consequence of reference points and has emerged as a primary behavioral indicator of reference point use (Heath et al. 1999; Pope and Simonsohn 2011; Allen et al. 2014). We expected that, although mean scores may fall near the midpoint of the range, range goal outcomes would actually be bimodal and cluster around the range endpoints just as they do around specific goals. Thus, rather than showing a uniform effect on performance, we argued that the range goal instead leads to high performance for some goal pursuers and low performance for others.

3.5.1 Design and Method

Participants (N = 345, average age = 20 years, 67.8% female) were recruited from a university behavioral lab in exchange for course credit. Participants were randomly assigned to one of three conditions (Goal: Range, Low Specific, High Specific) in a between-subjects design.

First, we manipulated goal condition. Participants were told that they would be solving a series of math puzzles where they needed to choose two numbers that summed to exactly 10 from a set of six numbers (task from Sharif and Shu 2017; all numbers had two decimal places). Participants in the Range condition were told that their goal was to solve 12-16 math puzzles. Participants in the Low Specific (High Specific) condition were told that their goal was to solve 12 (16) math puzzles. All participants were instructed that they could type the word “Quit” in a textbox at the bottom of any page to end the task when they were satisfied with their score.

Next, participants began the math puzzles task. Each puzzle was displayed on a separate page along with a running count of how many puzzles had been solved so far and a reminder of the participant’s goal. Participants were able to quit before reaching their goal or to continue beyond it, in which case the task ended (without warning) after 20 puzzles were completed.

Performance was measured based on the total number of puzzles the participant completed before exiting the task (capped at 20 for those who did not quit voluntarily before then).

3.5.2 Results

Average performance. Consistent with prior research, average performance in the Range goal condition (14.64 puzzles completed) fell near the midpoint of the range (14). This average performance was marginally worse than in the High Specific condition (15.79 puzzles; $t(244) = 1.82, p = .070$) and marginally better than in the Low Specific condition (13.61 puzzles; $t(240) = 1.76, p = .080$).

Performance clustering. Deeper analysis of the performance distribution in each condition found strong support for our predictions. Consistent with prior research, both specific goal conditions showed distinct clustering of outcomes immediately above the goal (see Figure 7). In the Low Specific condition, 59% of participants solved 12 or 13 puzzles before quitting, with 29% solving exactly 12, and no participants quit after solving exactly 11. In the High Specific condition, 48% of participants solved 16 or 17 puzzles before quitting, with 32% solving exactly 16, and no participants quit after solving exactly 15.

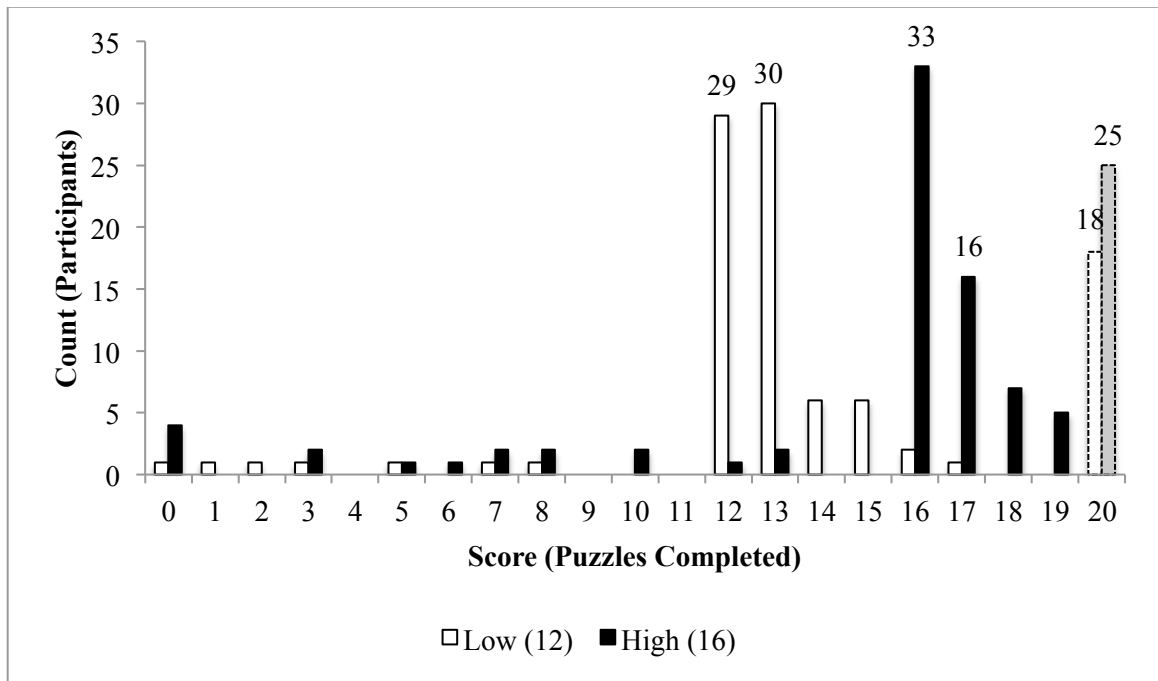


Figure 7. Distributions of scores in low (12) and high (16) specific goal conditions.

Supporting our predictions, the Range goal condition showed distinct clustering at both endpoints of the range and none at the midpoint of the range (see Figure 8). At the bottom of the range, 19% of participants solved 12 or 13 puzzles, with 15% solving exactly 12, and no participants quit after solving exactly 11. Chi-squared tests confirmed that Range goal pursuers were significantly more likely to score exactly 12 than those who did not have 12 as a salient reference point (i.e., the High Specific condition; 1% scored 12) ($\chi^2 = 14.68, p < .001$). At the top of the range, 44% of participants solved 16 or 17 puzzles, with 35% solving exactly 16, and only 3% quit after solving exactly 15. Chi-squared tests confirmed that Range goal pursuers were significantly more likely to score exactly 16 than those who did not have 16 as a salient reference point (i.e., the Low Specific condition; 2% scored 16) ($\chi^2 = 37.64, p < .001$).

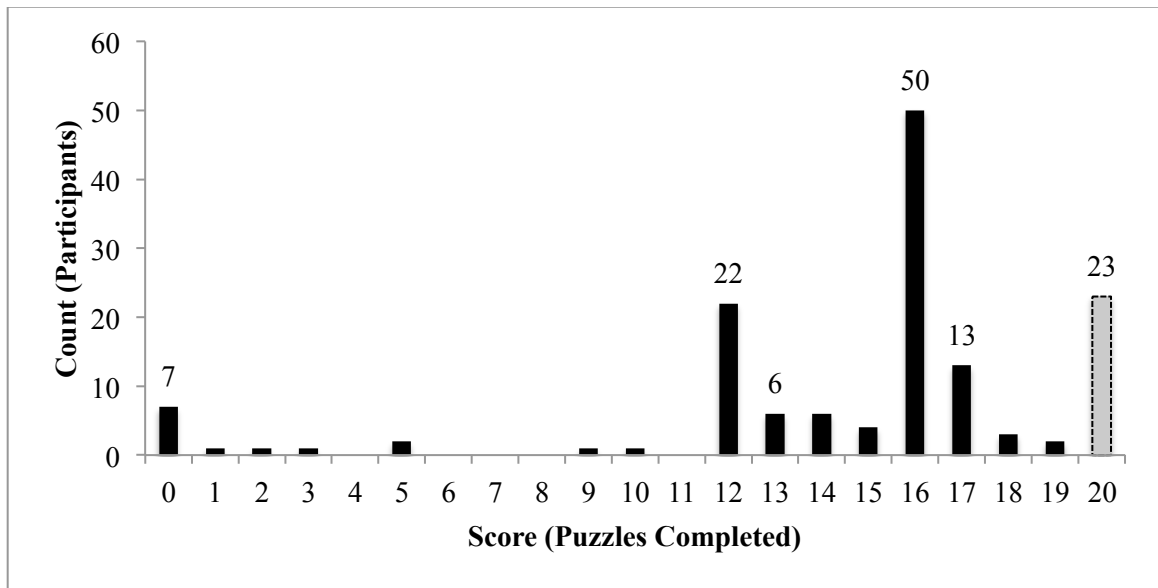


Figure 8. Distribution of scores in range goal (12-16) condition.

3.5.3 Discussion

Results of study 1 offer empirical support for the notion that both endpoints of a range goal serve as motivational reference points. Range goal performance outcomes distinctly cluster at the lower and upper endpoints of the range, just as they do for equivalent specific goals, and show no evidence of clustering elsewhere (e.g., the midpoint of the range). These findings suggest that, rather than having a uniform effect on performance, range goals instead split goal pursuers into two groups clustered at the endpoints of the range, respectively. Results of study 1 also reveal that individuals do not universally prioritize one endpoint or the other, but instead show a great deal of heterogeneity. However, the details of this heterogeneity and range goal pursuers' strategies remain unclear. Are individuals in these two clusters focused on their respective reference points throughout goal pursuit, or does attention shift along the way? And if

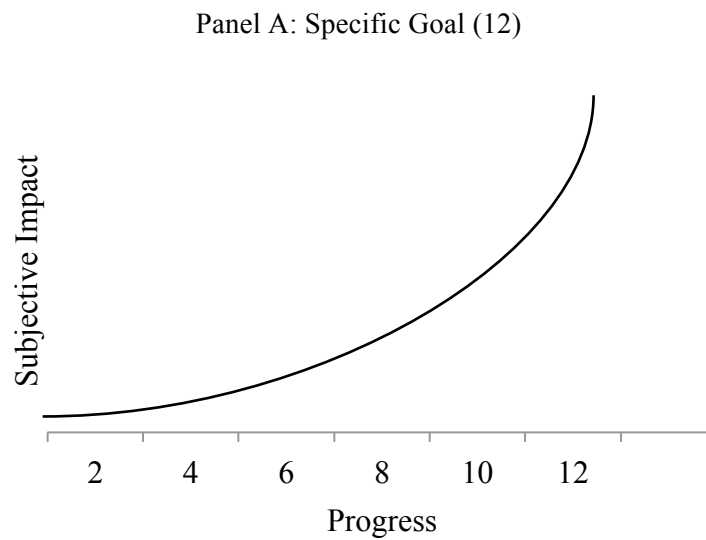
range goal pursuers do attend to both endpoints, does this provide any unique benefits beyond what a specific goal can provide?

3.6 Study 2

Study 2 has two objectives. First, building on study 1, it directly measures reference point focus in real time to identify potential dynamic strategies for range goal pursuit. Participants completed a proofreading task in the lab and were assigned a specific or range goal, depending on condition. In the range goal condition, rather than infer reference-point focus from performance outcomes, we measured participants' moment-to-moment focus over the course of the task and used the pattern of responses to determine their strategy. This approach enabled us to explore consumers' dynamic strategies for using the dual endpoints of a range goal as reference points, and the effects of employing different strategies on performance. Consistent with study 1 and with prior work on multiple reference points, we expected that participants would employ three dominant reference-point strategies: select-lower, select-upper, and switch. We further expected that those who followed the switching strategy would outperform those assigned a specific goal.

Second, study 2 offers direct evidence for the role of range goal endpoints as dual reference points by mapping the value function. We argued that the switching strategy improves performance because reducing the distance between the salient reference point and one's current state makes each unit of marginal goal progress (leading up to the lower endpoint of the range) seem more impactful (Heath et al. 1999; Koo and Fishbach 2012; Wallace and Etkin 2018). To test this reasoning, we measured the perceived impact of each incremental step of goal progress. In the specific goal condition (and among participants in the range goal condition who followed a select-upper strategy), we expected to find a monotonically increasing value function: the

subjective impact of marginal goal progress should start low and increase throughout the task (Figure 9, Panel A). Among participants in the range goal condition who followed the switching strategy, however, we expected to find a non-monotonic, double-peaked value function: the subjective impact of marginal goal progress should start low and increase until reaching the lower endpoint of the range, fall immediately upon entering the range (similar to starting a new goal; Drèze and Nunes 2011), and then increase until reaching the upper endpoint (Figure 9, Panel B).



Panel B: Range Goal (8-12) Switching Strategy

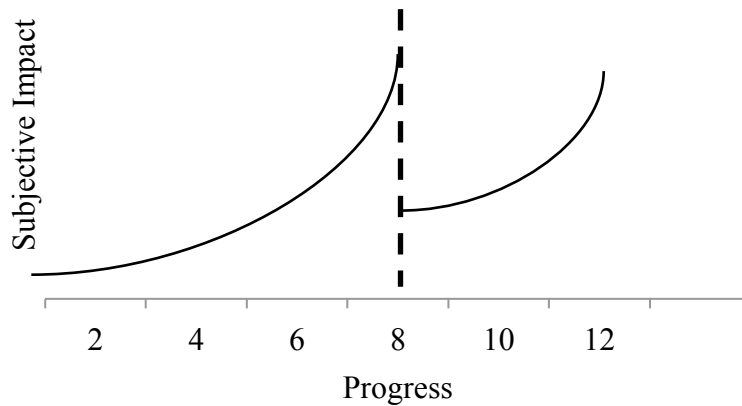


Figure 9. Subjective impact predictions for specific goal (12, Panel A) and range goal switching strategy (8-12, Panel B)

3.6.1 Design and Method

Participants ($N = 202$, average age = 20 years, 70.3% female) were recruited from a university behavioral lab in exchange for course credit and payment. In this and subsequent lab studies (studies 1-4), lab capacity and participant availability determined the sample size, and all participants were included in the analyses. Participants were randomly assigned to a goal condition: range versus specific. To allow for subgroup comparisons of different reference-point strategies within the range goal condition, participants were assigned to that (vs. the specific goal) condition at a 4-to-1 ratio.

Participants proofread a series of short text passages to identify the spelling error in each. The task included 12 text passages of between 300 and 400 words, presented one at a time in a randomized order. For each passage, we instructed participants to retype the misspelled word in the space provided. We also told them that if they wished to give up and end the task, to type

“quit” instead. If participants entered an incorrect response, they were prompted to try again; the only way to advance in the task was to correctly identify the error or quit.

After reading these instructions, we assigned participants a goal: to identify 8-12 (range goal) or 12 (specific goal) spelling errors in a row, depending on condition. We told them that if they failed to find the error in a passage or opted to quit, their streak would end and due to time constraints, they would not be able to start over or improve their score further.

All participants then completed a practice passage, to ensure they understood the instructions, and then began the main proofreading task. Before the first (and each subsequent) text passage, participants viewed a separate page that reminded them of their goal and provided progress feedback. They read, “Your goal on the proofreading task is to find 8-12 (12) errors in a row. So far, you have found X errors in a row.” We updated “X” to reflect the number of errors found so far (i.e., passages completed) in the task (e.g., after completing the second passage, the text read, “so far, you have found 2 errors in a row”). After proofreading a maximum of 12 passages, all participants (including those who had previously quit the task) answered basic demographic questions and were thanked for their participation. Performance was measured based on the total number of proofreading errors the participant found before exiting the task (capped at 12 for those who did not quit voluntarily before then).

During the proofreading task, we measured range goal participants’ reference-point focus. On the same page as the progress feedback (which appeared between each text passage), range goal participants read: “Your goal on the proofreading task has a lower end (8) and an upper end (12). Which of these two endpoints are you more focused on right now?” with response options: *The lower end (8)* and *The upper end (12)*. We used the pattern of responses to this question to identify participants’ reference-point strategy. We classified participants who always chose the lower endpoint (8) as following the select-lower strategy, those who always chose the

upper endpoint (12) as following the select-upper strategy, and those who initially chose the lower endpoint then switched to the upper endpoint (for all remaining passages) as following the switching strategy.

Also during the proofreading task, we measured the subjective impact of each marginal step of progress for all participants. On the same page as the progress feedback before each text passage, all participants were asked, “Given how many errors you’ve found so far, how much of an impact does finding the next error have on your goal?” on a scale from 1 (*No impact at all*) to 7 (*Very large impact*).

3.6.2 Results

Reference-point strategy. As expected and consistent with study 1, in the range goal condition, participants exhibited heterogeneity in their reference-point strategies. Supporting the notion that many range goal pursuers shift their focus dynamically, only 44% of participants focused on a single reference point throughout the task. This included 26% who followed the select-upper strategy and 18% who followed the select-lower strategy. Of the remaining participants (56% of total) who followed dynamic strategies, the vast majority (45% of total) followed the predicted switching strategy (i.e., initially focused on the lower endpoint and then switched permanently to the upper endpoint). Most participants in the switching category (62% of switchers) made this switch exactly when they reached the bottom of the range. All other combinations of responses (e.g., switching in the opposite direction, changing multiple times) fell within the remaining 12% of responses outside the strategies just described (i.e., Select-Upper, Select-Lower, and Switching).

Subjective impact. For ease of interpretation, we focused this analysis on participants who completed all 12 rounds of the proofreading task and range goal participants who switched exactly at the lower endpoint of the range (specific goal, $n = 31$; range goal, $n = 83$). As expected,

in the specific goal condition (which offers just the one end-state reference point), the subjective impact of marginal goal progress monotonically increased from the first ($M = 4.29$) to the final round of the proofreading task ($M = 6.03$; $t(30) = 4.00, p < .001$; figure 10). Also as expected, a similar pattern emerged among range goal participants who followed a select-upper strategy (which similarly emphasizes just the one end-state reference point): subjective impact increased from the first round ($M = 3.34$) to the final round of the task ($M = 4.39$; $t(37) = 2.19, p = .035$).

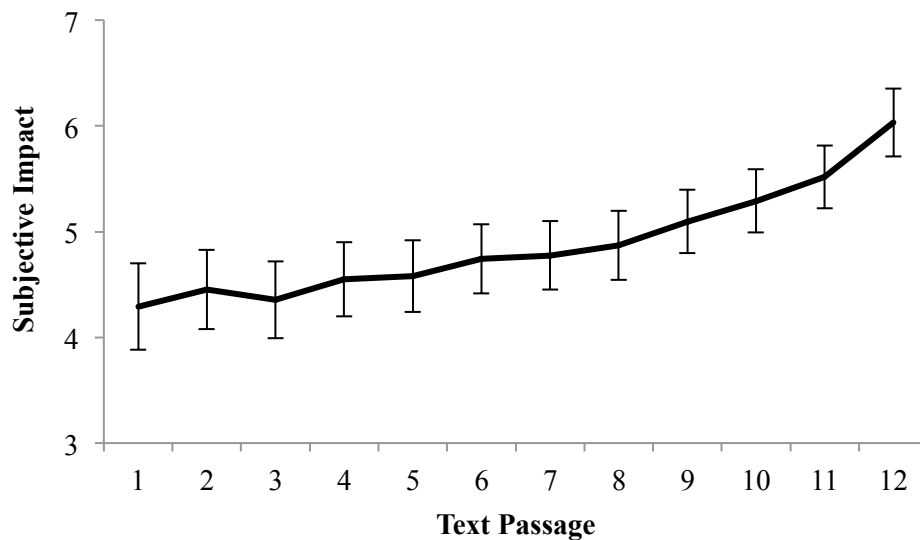


Figure 10. Subjective impact results for specific goal (12).

However, supporting our theory, range goal participants who followed the switching strategy showed a non-monotonic double-peaked pattern (figure 11): subjective impact increased from the first round ($M = 4.40$) to the eighth round of the task ($M = 5.76$; $t(44) = 3.74, p = .001$), sharply decreased from the eight to the ninth round, when goal pursuers entered the range and switched focus to the upper range endpoint ($M = 4.33$; $t(44) = 5.12, p < .001$), and then increased again from the ninth to the final round of the task ($M = 5.11$; $t(44) = 3.06, p = .004$).

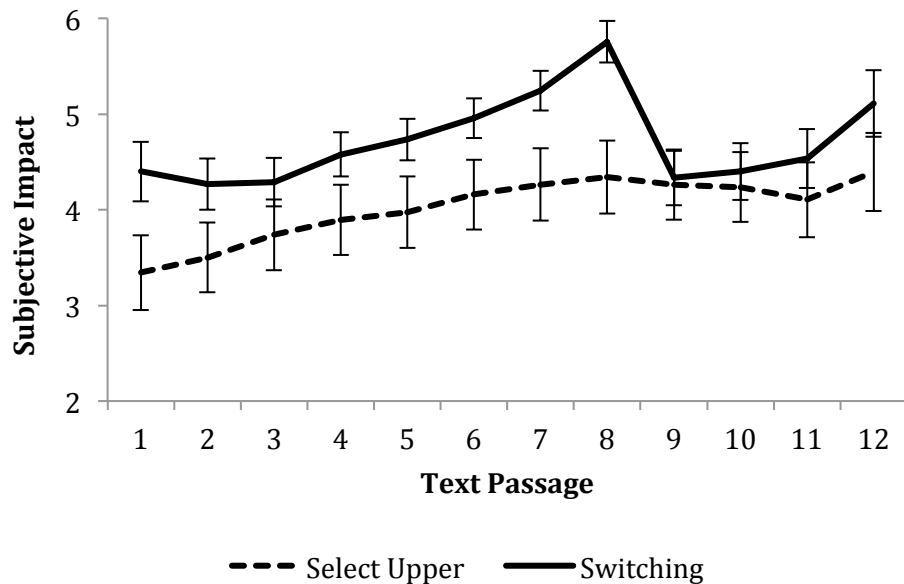


Figure 11. Subjective impact results for range goal (8-12, Select-Upper and Switching strategies).

Performance. In addition to identifying strategies, this study offered an initial look at performance outcomes using various strategies. Consistent with the findings of study 1, the mean score for all range participants feel near the midpoint of the range ($M = 10.13$), but means for the Select-Upper ($M = 11.21$) and Select-Lower strategies ($M = 5.41$) revealed a substantial difference based on reference point focus. Indeed, those using the Select-Upper strategy performed just as well as, and directionally better than, their counterparts in the Specific goal condition ($M = 10.47$; $t(80) = 1.18$, $p = .239$).

For those who used the Switching strategy, the mean score ($M = 12.00$) was even higher than for the Select-Upper strategy, although this difference was not statistically significant ($t(115) = 1.47$, $p = .143$). Most interestingly, those who used the Switching

strategy did perform significantly better than those in the Specific goal condition ($t(110) = 2.73, p = .007$). These findings offer suggestive support for the notion that the Switching strategy may enhance motivation, leveraging both reference points to offer performance benefits unavailable from a single reference point (e.g., a specific goal).

3.6.3 Discussion

Study 2 examines consumers' range goal reference-point strategies and corresponding motivational and performance outcomes. By directly measuring reference point focus during the task, this study not only captures the basic split in performance outcomes observed in study 1 but also reveals a dynamic switching strategy used by many range goal pursuers. In addition, this study offers an initial look at the performance outcomes associated with these strategies.

Although these comparisons may be influenced by self-selection and do not allow for causal inference, results of this study suggest that those who use a switching strategy may achieve the best performance outcomes, outperforming those with a high specific goal and (to a lesser extent) those who aim exclusively for the upper endpoint of the range. Studies 3 and 4 explore this possibility more deeply, experimentally manipulating strategies to provide clearer causal evidence.

This study also explores the underlying psychological process. By measuring the subjective impact of marginal progress over the course of goal pursuit, this study sheds light on an important mechanism through which differences in reference-point strategies affect behavior. This process evidence shows that judgments of marginal impact align with the expected effects of the value function based on participants' reported reference-point focus. Consistent with prior research (Heath et al. 1999; Wallace and Etkin 2018), in the specific goal condition, the subjective impact of marginal goal progress monotonically increases as participants approach the

goal's end-state (12 passages). In the range goal condition, however, different patterns emerge, depending on which reference-point strategy participants follow. Supporting our reasoning, whereas those who follow a select-upper strategy likewise show a monotonically increasing value function, participants who follow a switching strategy show a non-monotonic, double-peaked value function: the subjective impact of marginal goal progress monotonically increases as participants approach the lower endpoint of the range, falls sharply upon entering the range, then monotonically increases again as participants approach the upper range endpoint. In addition to supporting the validity of measuring moment-to-moment reference-point focus as a way to identify one's reference-point strategy, these results support the proposed role of such reference-based judgments in determining performance.

3.7 Study 3

Study 3 causally tests how adopting different reference-point strategies influences performance by manipulating (and randomly assigning) the strategy. We assigned participants a goal (range vs. specific) for the same proofreading task as in study 2, and then within the range goal condition we also assigned them to one of two reference-point strategies: select-upper versus switch. Consistent with the prior results, we predicted that participants assigned to the range goal/switching strategy condition would outperform the specific goal.

Moreover, because random assignment controls for the likely self-selection of high performers into the select-upper strategy group, we expected that the range goal/switching strategy condition would also outperform the range goal/select-upper condition (which, like the specific goal, provides just a single distant end-state reference point). Finding that the switching strategy improves performance relative to the select-upper strategy would further underscore that

switching reference points is beneficial because it reduces the average distance between one's current status and the focal reference point.

In addition, to further validate the robustness of our effects by ensuring that the previous findings were not contingent on methodological details like using ranges of 'normative width' (Ames and Mason 2015) or avoiding round numbers (Pope and Simonsohn 2011), study 4 also manipulates the width of the assigned range goal (8-12 vs. 10-12).

3.7.1 Design and Method

Participants ($N = 430$, average age = 24 years, 64.0% female) were recruited from a university behavioral lab in exchange for course credit and payment. Participants were randomly assigned to one condition of a 2 (reference-point strategy: select-upper vs. switch) x 2 (range goal width: identify 8-12 vs. 10-12 spelling errors) + 1 (specific goal: identify 12 spelling errors) between-subjects design. We did not include the select-lower strategy because of its low performance in the prior study.

Participants completed the same proofreading task as in study 2. The only difference was that in the range goal condition, we removed the reference-point focus measures and manipulated the strategy instead. Prior to beginning the task, participants read, "Experts suggest that you can motivate yourself and improve your performance on tasks like this by thinking about your goal in a particular way." In the select-upper condition, participants then read, "You should focus on reaching the top of the range (12 errors) as if that were your main goal." In the switching condition, participants instead read, "You should first focus on reaching the bottom of the range (8 or 10 errors, depending on goal width condition) as if that were your main goal. Then, once you've reached the bottom of the range, you should switch and focus on reaching the top end of the range (12 errors) as if that were your main goal." These strategy instructions were displayed

at the top of the computer screen throughout the duration of the proofreading task. In the specific goal condition, no additional information was provided.

3.7.2 Results and Discussion

Results of a 2x2+1 between-subjects ANOVA revealed a significant effect of strategy condition on performance ($F(1, 425) = 4.21, p = .041$) but no effect of range width ($F(1, 425) = .27, p = .602$) and no interaction between strategy and width ($F(1, 425) < .10, p = .988$).

Accordingly, we collapsed across the two range width conditions for the remainder of our analyses, focusing on the overall comparison between the specific goal condition and the switching versus select-upper range goal strategies. Average scores for these three groups are shown in figure 12.

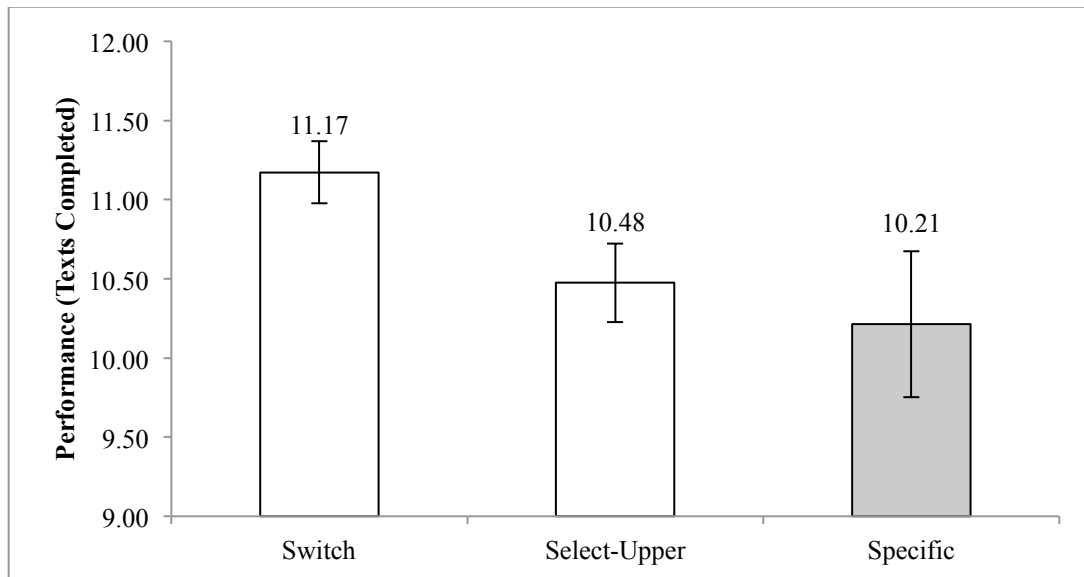


Figure 12. Average performance for Switching and Select-Upper strategies compared to Specific Goal condition.

As predicted and consistent with the prior results, the switching strategy outperformed the specific goal condition. Participants in the switching condition completed more proofreading

texts on average ($M = 11.17$) than those with a specific goal ($M = 10.21$; $F(1, 245) = 4.63, p = .032$). Switchers also significantly outperformed those in the select-upper condition ($M = 10.48$; $F(1, 245) = 4.39, p = .037$), who in turn were no different from the specific goal condition ($F(1, 245) = 0.34, p = .558$).

By experimentally manipulating reference-point strategy, study 3 provides causal evidence that consumers who treat the dual endpoints of a range goal as sequential reference points outperform those with a specific goal equal to the top of the range. Even in the absence of self-selection, the switching strategy improved performance relative to just focusing on a single distant end-state (the specific goal objective) throughout. At the same time, unlike in the previous study where participants self-selected strategies, the select-upper strategy performed no differently from the specific goal condition and significantly worse than the switching strategy. This supports the intuition that the high performance of select-upper in the previous study was due to a selection bias whereby high performers naturally aimed for the top of the range. When strategies were randomly assigned in study 3, select-upper participants behaved much more like specific goal pursuers (consistent with our theorizing) but the performance benefits of the switching strategy remained. This provides clearer evidence of the causal effect of switching on improved performance. Expanding on these findings, study 4 offers both a replication in an alternative task domain and also an empirical look at the proposed underlying process.

3.8 Study 4

Study 4 builds on the previous study by replicating our test of the causal effect of the switching strategy on performance and then delving into the underlying psychological process. This study also tests the robustness of the performance effects shown in studies 2 and 3 by

examining a different range goal (12-16 vs. 8-12) and a different task domain (math puzzles vs. proofreading).

3.8.1 Design and Method

Participants (N = 109; average age 23 years, 70.6% female) were recruited from a university behavioral lab in exchange for course credit. Participants were each randomly assigned to one condition in a two-cell (Switching vs. Specific) between-subjects design.

Participants completed the same math puzzles task as in study 1, with two adjustments. The first is that, in the Switching condition, we included the reference point strategy manipulation from study 3. The second is that we included the subjective impact measure from study 2 in order to capture the underlying process.

First, we manipulated participants' goal and reference point strategy, by assigned condition. Participants in the Switching (Specific) condition were told that their goal was to solve 12-16 (16) math puzzles.

Next, we manipulated participants' reference point strategy in the Switching condition. Just as in study 3, participants read, "Experts suggest that you can motivate yourself and improve your performance on tasks like this by thinking about your goal in a particular way. You should first focus on reaching the bottom of the range (12 puzzles) as if that were your main goal. Then, once you've reached the bottom of the range, you should switch and focus on reaching the top end of the range (16 puzzles) as if that were your main goal." These strategy instructions were displayed at the top of the computer screen throughout the duration of the math puzzles task. In the Specific condition, no strategy manipulation was included.

Next, participants began the math puzzles task described in study 1. Prior to each math puzzle, we measured the subjective impact of marginal progress for all participants. At the top of the page before beginning each puzzle, all participants were asked, "Given how many puzzles

you've solved so far, how much of an impact does solving the next puzzle have on your goal?" on a scale from 1 (*No impact at all*) to 7 (*Very large impact*).

3.8.2 Results

Performance. Results of a one-way between-subjects ANOVA supported our predictions about the performance benefits of the switching strategy. Replicating the findings of study 3, average performance was significantly higher in the Switching condition ($M = 14.98$ puzzles) than in the Specific condition ($M = 13.52$ puzzles; $t(107) = 2.07, p = .040$).

Subjective impact. Results of a one-way between-subjects ANOVA supported our predictions about the effect of the switching strategy (vs. a specific goal) on the subjective impact of marginal progress. Combining each participant's ratings on the subjective impact measure over the course of the task, this combined (i.e., mean) score was marginally higher on average for participants in the Switching condition ($M = 5.24$) than for those in the Specific condition ($M = 4.78$; $t(107) = 1.63, p = .105$). Scores for each individual round of the task are shown in Appendix E.

Underlying process. To examine the proposed underlying role of the subjective impact of marginal progress, we ran a bias-corrected bootstrapping mediation analysis with 5000 samples (PROCESS Model 4, Hayes 2013). Results supported our predictions, revealing a significant indirect effect of condition (Switching vs. Specific) on performance mediated by subjective impact ($ab = .23, 95\% \text{ CI } [.01 \text{ to } .62]$). Participants in the Switching condition outperformed those in the Specific condition, driven by an increase in the subjective impact of marginal goal progress during goal pursuit.

3.8.3 Discussion

Results of this study found further support for our predictions, replicating the key finding of study 3 and also shedding light on the underlying process. Compared to those with a specific goal to solve 16 puzzles, participants with a switching strategy and a range goal to solve 12-16 puzzles performed better on average, driven by seeing each marginal step of progress as more impactful. This supports the notion that the switching strategy enhances motivation and performance by keeping individuals closer to their salient reference point on average during the course of goal pursuit.

Further supporting our theorizing, results showed that the difference in subjective impact emerged primarily before participants reached the range (i.e., when the two conditions were using different reference points) rather than after range goal participants had switched. In the first twelve rounds of the task (i.e., prior to the range), the Switching condition showed an even stronger advantage in subjective impact scores than for the full task ($M_{Switching} = 5.39$, $M_{Specific} = 4.70$; $t(107) = 2.26$, $p = .026$). However, in the remaining four rounds after Switching participants had reached the range, this difference actually reversed ($M_{Switching} = 4.56$, $M_{Specific} = 5.32$; $t(107) = 2.26$, $p = .026$). These findings indicate that the motivational benefit of the switching strategy (vs. a specific goal) emerges prior to reaching the bottom of the range, consistent with our theorizing and in contrast to competing mechanisms such as positive feedback or increased self-efficacy that would predict a motivational benefit *after* reaching the lower range endpoint (Drèze and Nunes 2011; Fishbach, Dhar, and Zhang 2006; Gal and McShane 2012).

3.9 General Discussion

The current research posed two key questions. First, when a goal offers multiple end-state reference points, how do individuals use those competing reference points? Second, how do those

different reference-point strategies influence performance (and can any outperform a specific goal)? Four studies tackled these questions through a series of effortful goal pursuit experiences and real performance outcomes.

We focus our investigation on the context of range goals, enabling us to address broad questions of how multiple reference points influence behavior while also advancing understanding of the effects of range goals as a motivational tool. Study 1 confirms that a range goal's endpoints both serve as strong reference points during goal pursuit, revealing clear clustering of performance outcomes around both endpoints. This reveals that, although average performance falls near the midpoint of the range, a range goal is better understood as two separate end-state objectives and almost no individuals show performance at the midpoint. Study 2 shows that our three predicted strategies (select-upper, select-lower, and switching) capture the vast majority of range goal pursuers and that switching is the most prevalent strategy. This study also offers initial evidence in support of our prediction that the switching strategy leverages both reference points to enhance motivation and performance. Building on these findings, studies 3 and 4 experimentally test the causal effect of strategies on performance, providing further empirical support for the prediction that the switching strategy improves performance and also examining the underlying process. Together, these studies highlight an important benefit of a range goal's multiple reference points and novel way in which range goals can lead to better performance outcomes than specific goals.

3.9.1 Theoretical Contributions

This research makes three main conceptual contributions. First, this work contributes to research on how multiple reference points influence behavior, a complex and important question that arises in the many real-world settings where multiple reference points are available.

Emerging research has begun to grapple with this question in both judgment and decision-making

(Baucells et al. 2011; March and Shapira 1992) and goal pursuit contexts (Bonezzi et al. 2011; Carton et al. 2011; Wallace and Etkin 2018). The present work contributes in two ways. First, by identifying the dual end-state reference points that range goals make salient, we introduce range goal pursuit as a novel context for studying this theoretical question. Second, rather than seeking to describe reference-point focus in the aggregate, as has previously been the norm, we investigate heterogeneity in how consumers use multiple reference points during goal pursuit. Notably, our investigation reveals substantial variation in the reference-point strategy consumers adopt: for some, the upper endpoint of the range dominates and for others, is ignored entirely; for some, reference-point focus is static and for others, it is dynamic. Our findings underscore that acknowledging the heterogeneity in how multiple reference points influence behavior is essential to understanding their consequences.

The second major contribution of this work is to incorporate range goals into the theoretical model of goals as reference points. This connection simultaneously extends the scope of the goals-as-reference points model, which has largely focused on specific goals (Allen et al. 2016; Bonezzi et al. 2011; Heath et al. 1999), and offers a valuable new perspective on range goals, which have previously been framed mostly in terms of specificity versus ambiguity (Locke and Latham 2002; Wright and Kacmar 1994). Whereas prior work emphasized what range goals lack compared to specific goals (a precise performance objective), we argue that from a reference-points perspective, they actually offer something more (two end-state reference points rather than one).

Third, building on this extension of theory, the present work contributes to understanding of how range goals influence goal pursuit and performance. Based on empirical findings that specific goals outperform vague do-your-best goals (Locke and Latham 1990) and an understanding of range goals as another type of vague goal (Naylor and Ilgen 1984), prior

research has upheld specific goals as the gold standard for effective goal-setting. Although this literature identifies some secondary benefits of range goals (e.g., feelings of accomplishment and goal reengagement, Scott and Nowlis 2013), its focus has generally been on how range goals can undermine goal commitment and increase variance in performance (Locke et al. 1989; Wright and Kacmar 1994). By approaching range goals from a new perspective and examining their effects as dual reference points, our work leads to novel conclusions about range goals as a motivational tool. Whereas prior work finds that range goals produce equal or lesser average levels of performance than specific goals (Locke et al. 1989), our findings show that this aggregate pattern masks more nuanced effects: leveraging both endpoints of a range goal as sequential reference points enables consumers to achieve even better performance outcomes.

Notably, we find these effects even for range goals where the upper endpoint of the range is equal to the specific goal (i.e., the most challenging reference point is held constant). This is a very conservative approach, as prior research has primarily considered “high-low” range goals (Scott and Nowlis 2013) or range goals with the same “average difficulty” as a specific goal (Locke et al. 1989), both of which entail setting the specific goal equal to the midpoint of the range. Because high-low range goals actually offer a reference point more challenging than the specific goal objective, our findings suggest that such ranges may offer an even greater performance advantage relative to specific goals, as both switching and select-upper strategies would likely outperform a specific goal in that context.

3.9.2 Practical Implications

In addition to their theoretical contributions, the present findings also have practical implications. For consumers, this research offers important insights for effective goal-setting and goal pursuit. Our findings suggest that in a variety of goal contexts (e.g., weight loss, financial savings, professional or academic settings), setting range goals (e.g., lose 25-30 pounds this year,

save \$1500-\$2000 this month, make 10-15 sales, read 4-6 chapters), rather than specific goals, may enable people to achieve better performance outcomes. In addition to providing secondary benefits like increased flexibility, enhanced feelings of accomplishment, or a greater desire to reengage with the same goal (Scott and Nowlis 2013; Sharif and Shu 2017), when pursued with the right strategy, range goals can improve performance. Moreover, for range goal pursuers who would otherwise select-lower or even select-upper, our findings indicate that adopting a switching strategy can help them perform better. Importantly, our studies show that this strategy is effective not only for those who naturally select it (study 2), but also for consumers who deliberately adopt it after being advised of its benefits (studies 3 and 4).

For marketers and policy-makers, this research sheds light on how consumers respond to and pursue range goals. Our findings are most relevant to situations where marketers create goals for consumers individually, such as in loyalty reward or referral programs, apps and services for managing personal goal pursuits, and cases where goals are used to encourage behavioral change or sustained product engagement (e.g., in-app badges for streaks of regular use). Our research suggests that across such contexts, range goals can be a valuable and effective motivational tool. Moreover, the findings of studies 3 and 4 demonstrate that range goal pursuers who are explicitly advised to adopt a switching strategy (vs. naturally self-select it) still reap the motivational benefits of using the strategy, suggesting that instructions similar to those in our studies are a viable intervention for marketers to help maximize goal attainment.

3.9.3 Future Research Directions

The present findings also point to exciting opportunities for future investigation. First, when pursuing a range goal, what leads consumers to spontaneously switch reference points, and what determines when they will switch? We have argued for a strategic explanation over a learning-based explanation, particularly based on the nature and timing of switching behavior we

observe. One component of this is the fact that the vast majority of switching in our data is from the lower to the upper endpoint of the range, whereas learning should produce more symmetric patterns (i.e., comparable switching from upper to lower). In addition, learning-based switching should show (1) heterogeneity in timing based on the speed of individuals' learning, (2) most switching near the beginning of the task as participants become familiar with it, and (3) no distinct "spikes" in switching behavior at a particular point in the task. Our data, which is more consistent with a strategic account, instead shows strong clustering in switch timing at the lower endpoint of the range and very little switching at the beginning of the task. Even within our strategic explanation for switching behavior, future research could look more closely at the underlying mechanisms to better understand whether these strategies serve to maximize motivation, to increase feelings of satisfaction, or to optimize some third criterion the literature has not yet examined.

A second question for future research to explore is, when and why do consumers set range goals rather than specific or do-your-best goals? Our findings suggest that some consumers might set range goals as a way to maximize performance, either consciously or as a behavioral rule shaped by prior goal outcomes. Similarly, some previous work shows that range goals tend to increase feelings of accomplishment (controlling for performance), suggesting a subjective benefit to range goals even when they do not enhance performance. Another possibility is that consumers use range goals to reflect uncertainty about the desired outcome (Wright and Kacmar 1994) or to allow themselves a degree of flexibility (Sharif and Shu 2017). The present research's reframing of range goals as dual reference points also introduces an intriguing new explanation: consumers may set range goals as a consequence of having two salient reference points available in the goal-setting environment. Just as an arbitrary salient value can be adopted as a specific goal

(Pope and Simonsohn 2011), it is plausible that a pair of salient values could be adopted as a range goal.

This leads us to a third and final question for future research: where do the individual endpoints of a range goal come from? One possible answer is the mechanism just described, whereby two salient values in the consumer's mind naturally become the endpoints of the range. In contrast to this explanation, another possibility is that range goals actually arise as "confidence intervals" around a midpoint target, consistent with prior work on high-low range goals (Locke et al. 1989; Scott and Nowlis 2013; Wright and Kacmar 1994). Yet another possibility is that one endpoint is set initially and the other enters as an adjustment to it: the upper endpoint may serve as a "stretch goal" beyond a lower initial target, or the lower endpoint may serve as a "fallback" allowance for failure to reach a higher initial target (similar to an "emergency reserve," Sharif and Shu 2017). It is also likely that each of these explanations may be true for different individuals – just as they differ in which reference-point strategy they adopt, consumers may also differ in which approach they take to goal setting. Indeed, these two phenomena are likely intertwined: consumers' personal goal-setting processes may shape their interpretation and usage of range endpoints as reference points when pursuing goals designed by others.

This paper tackles the questions of how multiple reference points influence behavior by examining how goal pursuers use the endpoints of a range goal as reference points and how those strategies shape subsequent behavior. This represents a novel approach to both reference points and range goals, contributing to the influential and growing literatures in both areas. In addition to providing novel findings with both conceptual and practical implications, this approach also opens fascinating new avenues for future investigation. Building on our findings, future research can look beyond range goals to shed further light on how goal pursuers think and behave in a world where multiple reference points are often available.

4. Essay 3: “Restraint Goals as Reference Points”

To achieve desired outcomes, consumers often set goals. They may set a goal to walk 10,000 steps daily, to volunteer 20 hours for charity, or to earn \$500 as a Lyft driver. Marketers also often encourage consumers to adopt specific goals. Coffee shops promise a free beverage after an initial 10 purchases, airlines offer a new tier of status for accumulating 50,000 miles, and apps like Headspace award badges for completing a certain number of sessions. Decades of research spanning diverse fields affirms that goal setting—and setting specific goals in particular—can improve performance (Locke and Latham 1990; Locke et al. 1981).

One reason that specific goals have this beneficial effect is because consumers tend to adopt them as reference points (Heath, Larrick, and Wu 1999). To determine their motivation, consumers compare their current performance to their goal objective (the reference point). Being below the goal feels like a loss, which, particularly when close to the goal, encourages consumers to do more. If a consumer with a goal to walk 10,000 steps, for example, had walked just 9000 steps so far, this current level of progress would feel like a loss (relative to the 10,000-step goal), motivating that person to take more steps.

In addition to setting specific goals to promote certain behaviors (e.g., walk 10,000 steps, earn \$500), however, consumers also set specific goals to limit or restrain their behavior. They may set a \$100 budget for weekly groceries, an 1800-calorie budget for daily food intake, or a limit of 6 hours of television. In such budgeting or “restraint goal” domains, rather than an amount to be obtained, the goal objective specifies an amount not to be exceeded, thus motivating consumers to restrain their behavior accordingly.

Presumably, restraint goals should also act as reference points. A consumer with a \$100 grocery budget, for instance, should evaluate his spending on groceries so far (e.g., \$60) in

relation to this goal, and the discrepancy between his current performance and the goal objective should determine subsequent motivation. But will the effects on goal-related judgments be the same? Will being below a restraint goal objective, for instance, increase consumers' motivation to restrain their behavior?

This research explores how reference points influence judgments and behavior in restraint-oriented goal domains. We propose that in restraint-goal domains, the value function will take on a “mirrored” form of the traditional S shape. This is based on the notion that restraint goals involve tracking the accumulation of negative rather than positive steps of progress (e.g., dollars spent vs. dollars earned). Consequently, and in contrast to one of the most influential implications of goals-as-reference-points theory (i.e., that consumers are more motivated below a goal than above it), we predict that in restraint-goal domains, consumers will be more motivated above the goal (e.g., having spent \$110 on groceries) than below it (e.g., having spent \$90 on groceries).

Our findings make three main contributions. First, to the literature on goals and motivation, this research provides valuable new insight into an important category of consumers' goals: goals to restrain behavior (e.g., limit spending or restrict caloric intake). We discuss what makes these goals unique and demonstrate some systematic differences in goal-related judgments and behavior that emerge as a result.

Second, to the literature on judgment processes and reference points, this research challenges the notion that the value function is always concave above a reference point and convex below it. By considering the distinct implications of loss aversion in domains where exceeding the reference point is undesirable, we identify a “mirrored” form of the S-shaped value function, generating interesting reversals from previously documented reference point-based effects.

Third, to the literature on consumer budgeting and mental accounting, this research offers a novel perspective on how to set effective budgets, limits, and other goals to restrain behavior. Integrating relevant insights from Prospect Theory and goals research, our findings suggest that establishing more conservative budgets may increase motivation to restrain behavior (even if the budget is surpassed).

The paper proceeds as follows. First, we review relevant background information on goals-as-reference points, focusing on how the value function influences goal-related judgments and behavior. Then, we define restraint-goals and discuss how loss aversion and diminishing sensitivity influence consumers' evaluations of their current performance in this unique context. From there, we develop a series of hypotheses about the shape of the value function and its implications for motivation and setting effective budgets. We present a series of six studies that test these predictions, and conclude with a discussion of the contributions of these findings to the literatures on goals and motivation, judgment processes and reference points, and consumer budgeting and mental accounting.

4.1 Goals as Reference Points

The theory of goals-as-reference points is a leading conceptual framework examining goal pursuit based on the influence of goals on judgments and decision-making. This theory posits that goal objectives serve as reference points for evaluating goal-related outcomes (Heath et al. 1999). Through this reference point role, goals can have powerful effects on motivation and behavior even when their objectives carry no particular rewards or penalties (i.e., “mere goals,” Heath et al. 1999). Importantly, viewing goals as reference points provides a parsimonious explanation for many key findings in goals research (for a summary, see Heath et al. 1999). This single mechanism connects an array of phenomena including the motivational goal gradient; the

steep drop-off in motivation following attainment of even “mere” goals; the performance benefits and hedonic costs of specific, challenging goals; and the motivational drawback of setting difficult or distant goals that make individual steps of progress feel insignificant (i.e., the “starting problem”).

The key to understanding the many consequences of goals as reference points is the *value function*. This function, first described by Prospect Theory, captures the systematic influence of a reference point on the perceived value of potential outcomes and on the perceived marginal differences between outcomes (Kahneman and Tversky 1979). In the context of goals, this value function drives both goal pursuers’ satisfaction (or disappointment) with the outcomes they experience and their motivation to exert goal-related effort (Heath et al. 1999). This latter effect is based on the perceived impact of marginal progress: when the next step of progress seems highly valuable (i.e., the value function is steep), consumers exhibit greater motivation. This mechanism explains such motivational phenomena as the goal gradient effect and the steep drop-off in motivation following goal completion. Critically, the seminal paper introducing the theory of goals as reference points found that these goal-based judgments follow a value function with the same key properties described by Prospect Theory (Heath et al. 1999; Kahneman and Tversky 1979). Namely, the value function around a goal objective exhibits both *loss aversion* and *diminishing sensitivity*.

Loss aversion makes the hedonic impact of any loss larger than that of a gain of the same magnitude. For example, for an athlete with a goal to do 50 pushups, the disappointment of falling short by 5 pushups is greater than the pleasure of doing 5 extra. This means that each unit change in outcomes below the reference point (in losses) produces a bigger difference in subjective value than the same unit change above the reference point (in gains). As a result, the left side of the typical value function is steeper than the right side (see figure 13).

Diminishing sensitivity makes differences between outcomes far from the reference point (either above or below) seem less impactful than differences of the same magnitude near the reference point. For example, for an athlete with a goal to do 50 pushups, the difference between falling short by 10 and falling short by 15 seems less significant than the difference between 5 and 10. This means each unit change in outcomes produces a smaller difference in subjective value as one moves further from the reference point (in either direction). As a result, the typical value function is S-shaped: concave on the gain side and convex on the loss side (see figure 13).

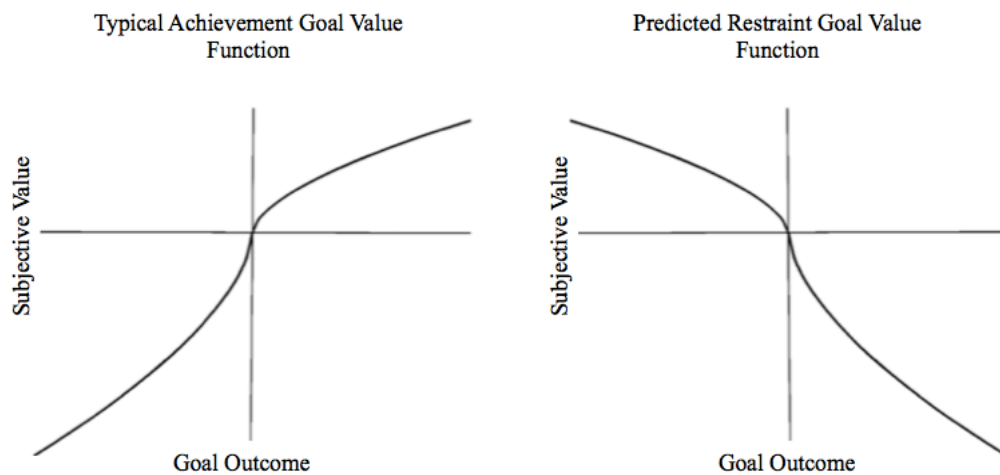


Figure 13. Achievement and Restraint Goal Value Functions

Although this theoretical framework has provided valuable insights in prior research, that research has focused on achievement-oriented goals such as doing 50 pushups, scoring 90 points on an exam, or running a marathon (Allen et al. 2016; Heath et al. 1999; Wallace and Etkin 2018; Wu et al. 2008). These types of goals emphasize encouraging desired behaviors (e.g., completing pushups) and tracking progress and performance based on the accumulation of these positive

steps. Many important consumer goals do not share these characteristics. The broader research on goals offers many examples of goals outside this positively framed, achievement-oriented category, including goals for smoking cessation (Borrelli and Mermelstein 1994), dieting (Cochran and Tesser 1996), managing limited resources (Koo and Fishbach 2012; Soman and Cheema 2004), and avoiding undesirable or addictive behaviors (Elliot 2006). In contrast to achievement goals, these goals emphasize restricting behavior and tracking progress and performance based on the accumulation of negative steps (e.g., cigarettes smoked, dollars spent). The present research explores whether and how the distinct features of these goals, in contrast to traditional achievement goals, will alter the consequences of such goals as reference points.

Will the effects of goals as reference points play out the same in these other goal domains as in achievement contexts? Or will the structural differences from achievement goals also change the implications of these goals as reference points?

4.2 Restraint Goals as Reference Points

In contrast to the “achievement goals” previously addressed in the goals-as-reference points literature, we introduce a second category of “restraint goals.” These goals involve restricting behavior, setting specific limits or budgets as goal objectives, and tracking progress and performance based on the accumulation of undesired actions (e.g., dollars spent). Although some prior work has argued that goals of this kind are evaluated on a binary “all-or-nothing” basis (Soman and Cheema 2004), we argue and find empirical evidence that they are evaluated along a graded value function consistent with Prospect Theory. However, unlike the value function for achievement goals, we propose that diminishing sensitivity and loss aversion will produce a mirrored form of the traditional S-shaped value function for restraint goals, and that this distinct shape will invert some previously established goal-related phenomena.

We define restraint goals as goals to restrict or limit a behavior. Such goals may be formalized as budgets (e.g., a \$100 budget for weekly groceries, an 1800 calorie-budget for daily food intake) or formulated as more general limits (e.g., watch no more than 6 hours of television, skip no more than 5 planned workouts). The key metric of performance for restraint goals is the accumulation of undesired steps toward the budget or limit (e.g., dollars spent, workouts skipped). Thus restraint goals often arise naturally in managing avoidance (vs. approach) behaviors, which involve motivation to avoid a punishment or negative stimulus (Elliot and Church 1997; Elliot 2006). However, the restraint-achievement dichotomy differs from approach-avoidance in that the same basic behavior with the same underlying incentives can become either a restraint or an achievement goal based on how progress is measured (e.g., workouts completed vs. workouts skipped). At the same time, this dichotomy is driven by the goal's structure and framing, making it less flexible or subjective than other goal-related constructs such as regulatory focus (Brendl and Higgins 1996; Idson, Liberman, and Higgins 2000; see General Discussion).

We propose that restraint-goals produce a distinct form of the value function: a mirror image of the traditional S-shape (see figure 13). This proposition is based on the fact that restraint goal progress or performance is measured by the accumulation of undesired steps, such as dollars spent from a budget. This means that outcomes of higher magnitude (e.g., more dollars spent, more workouts skipped) are subjectively worse than those of lower magnitude. Thus each incremental step *decreases* the subjective value of the outcome: spending \$100 on a purchase is better than spending \$110, which is better than spending \$120. The first and most direct implication of this is that, as outcomes increase in objective magnitude, the restraint goal value function slopes downward rather than upward (like the traditional value function), as shown in figure 13.

Closely tied with this change in the general slope of the value function is a change in the effects of loss aversion. Because the value function slopes downward, losses (i.e., subjectively worse outcomes) fall nominally above the reference point (i.e., to the right) and gains (i.e., subjectively better outcomes) fall nominally below it (i.e., to the left). For example, compared to the neutral outcome of exactly spending one's \$100 budget on a shopping trip, spending \$120 feels like a loss whereas spending \$80 feels like a gain. Just as loss aversion makes people more sensitive to losses than to equal-sized gains in other contexts, we expect that it will have a corresponding effect for restraint goals. Specifically, the loss side of the value function should be steeper than the gain side. For traditional achievement goals (e.g., complete 50 pushups), loss aversion makes the value function steeper to the left of the reference point (in losses) than to the right (in gains). In contrast, for restraint goals we propose that loss aversion will make the value function steeper to the right of the reference point (in losses) than to the left (in gains), as shown in figure 13.

Although loss aversion plays out differently for restraint versus achievement goals, diminishing sensitivity should have similar effects in both contexts. Because consumers show diminishing sensitivity, differences between outcomes near the reference point have a greater impact on subjective valuations than equal-sized differences further from the reference point. As a result, across both achievement and restraint domains, the value function should be relatively steep near the reference point and shallower further from it (in either direction). Translating this to the shape of the value function, diminishing sensitivity makes the traditional value function convex to the left of the reference point (in losses) and convex to the right (in gains). For restraint goals, we predict that the value function will similarly be concave for gains and convex for losses. However, because the placement of the gain versus loss sides of the value function are mirrored,

the restraint goal value function will be concave to the right of the reference point (i.e., the goal) and convex to the left of it, as shown in figure 13.

In sum, we propose that, like achievement-goals, restraint goals act as reference points against which consumers compare possible outcomes, and that these evaluations are subject to both diminishing sensitivity and loss aversion. The result of these two features in the context of restraint goals is a mirrored form of the traditional S-shaped value function, with a shallow and concave gain side to the left and a steep and convex loss side to the right.

H1: Restraint-goals produce a mirrored value function, monotonically decreasing (rather than increasing) in utility and with a steeper slope to the left (rather than the right) of the reference point.

4.3 Consequences for Motivation and Goal Setting

We suggest that this mirrored form of the value function has important implications for goal-directed judgments and behavior. Indeed, several key implications of the restraint goal value function are direct reversals of the previously established effects of goals as reference points in achievement domains.

One important consequence of goals as reference points is to shape the dynamics of consumer motivation during goal pursuit (Heath et al. 1999; Wallace and Etkin 2018). Because motivation is enhanced when marginal goal progress is more subjectively valuable, consumers are more motivated when they are on a steeper part of the value function. A leading example of this in achievement domains is that, due to loss aversion, goal pursuers are highly motivated just before reaching a goal (e.g., after completing 48 pushups with a goal of 50) and show an

immediate drop in motivation after reaching it, even without any tangible change in incentives for further progress (Heath et al. 1999). This is explained by loss aversion making the value function much steeper to the left of the reference point (in losses) than to the right (in gains).

In the context of restraint goals, we predict that the mirrored form of the value function will reverse this effect. Because the loss side of the restraint goal value function falls to the right of the reference point (e.g., being over budget), loss aversion should make the value function steeper on that side than on the left. This means that, as individuals move from the left to the right side of the value function (e.g., crossing over their budget) they should show an immediate *increase* in motivation driven by a greater perceived impact of marginal spending. So, for example, a shopper with a budget of \$100 will be fairly motivated to restrain further spending after having spent \$98 so far, but should become even more motivated as he crosses beyond his budget (e.g., \$102 spent so far) and into the realm of losses.

H2: Motivation is greater just to the right of a restraint goal (in losses) than an equal distance to the left of it (in gains).

Another major consequence of goals as reference points is to determine the effects of goal specificity. Prior research has shown that consumers with specific versus nonspecific (“do-your-best”) goals evaluate their performance using different reference points (Heath et al. 1999; Wallace and Etkin 2018). Whereas the behavior of specific goal pursuers reflects a value function based on the goal objective as a reference point, those with a do-your-best goal instead tend to use their starting point as a reference point (Wallace and Etkin 2018). In the context of achievement goals, this makes specific goal pursuers less satisfied with the same level of objective performance (Heath et al. 1999). This difference in satisfaction emerges because the specific goal

objective is a higher, more desirable outcome (e.g., completing 50 pushups) than the starting point (0 pushups), and using it as a reference point shifts the value function to make any given outcome less satisfying.

We predict that the opposite will occur for restraint goals: setting a specific (vs. do-your-best) restraint goal will instead make consumers feel more satisfied with their performance. Because restraint goals involve the accumulation of undesired actions (e.g., dollars spent), a specific goal objective is a higher, *less desirable* outcome than the starting point (e.g., \$100 budget vs. \$0 spent). Thus using the goal objective instead of the starting point as a reference point will shift the value function to make any given outcome *more satisfying* (see table 3).

H3a: Consumers with specific (vs. do-your-best) restraint goals will be more satisfied with the same absolute level of performance.

Table 3. Reference Point Effects of Specific and Do-Your-Best Goals During Achievement and Restraint Goal Pursuits

Domain	Goal Type	Reference Point	Position Relative to Reference Point	Relative Satisfaction	Relative Motivation
Achievement	Specific	Goal Objective	Below (Losses)	Low ¹	High ²
Achievement	Do-Your-Best	Starting Point	Above (Gains)	High ¹	Low ²
Restraint	Specific	Goal Objective	Below (Gains)	High (H3a)	Low (H3b)
Restraint	Do-Your-Best	Starting Point	Above (Losses)	Low (H3a)	High (H3b)

¹ Heath, Larrick, and Wu 1999

² Wallace and Etkin 2018

Setting a specific restraint goal not only changes the level of the reference point, but also changes which side of the value function goal pursuers are on during the course of goal pursuit. During goal pursuit, consumers move from the initial-state toward the end-state reference point

(i.e., the goal). This means that specific goal pursuers, who focus on the end-state reference point, are generally below that reference point along the dimension of goal progress (i.e., on the left side of the value function).

In contrast, because individuals with do-your-best goals tend to compare themselves to the initial-state reference point, they are generally above their reference point (i.e., on the right side of the value function). Prior work shows that, for achievement goals, this generally makes specific (vs. do-your-best) goals more motivating by placing goal pursuers on the steeper side of the value function (Wallace and Etkin 2018). Because the value function is mirrored for restraint goals, we instead predict that specific goal pursuers (who are on the shallower left side of the value function) will tend to be *less motivated* than those with do-your-best goals (who are on the steeper right side of the value function).

H3b: Consumers with specific (vs. do-your-best) restraint goals will be less motivated because they will be in a gain (vs. loss) frame.

Understanding goals as reference points also has important consequences for the effects of goal difficulty. One effect of goal difficulty in this framework is that individuals who set specific, challenging achievement goals tend to see individual steps of progress as less valuable because their reference point is further away (i.e., they are on a shallower part of the value function). This decrease in the perceived impact of marginal progress in turn undermines motivation (i.e., the “starting problem”, Heath et al. 1999).

We predict that this problem will not occur for restraint goals. As outlined above, outcomes of higher magnitude are worse than those of lower magnitude in the context of restraint goals. Thus when consumers adopt challenging goals to help themselves attain better outcomes,

those goals are actually *lower* in magnitude (e.g., a smaller budget). This means that the end-state reference point of a difficult restraint goal is actually closer to the starting point than that of an easier goal, placing consumers on a relatively *steep* part of the value function (see table 4). Thus, unlike challenging achievement goals, challenging restraint goals do not undermine motivation due to diminishing sensitivity.

H3c: Consumers with more difficult restraint goals will have less distant reference points and will therefore see marginal progress as more impactful than those with easier goals.

Table 4. Reference Point Effects of Goal Difficulty for Achievement and Restraint Goals

Domain	Goal Type	Goal Magnitude	Perceived Impact of Marginal Progress	Relative Motivation
Achievement	Difficult	High	Low	Low
Achievement	Easy	Low	High	High
Restraint	Difficult	Low	High	High
Restraint	Easy	High	Low	Low

Five studies tested our hypotheses. First, Study 1 provides an initial look at the shape and key features of the value function for restraint goals in two prevalent domains (financial budgeting and time management; H1). Study 2 builds on the first study by replicating key findings with a real goal pursuit experience in the lab.

Studies 3-5 test consequences for motivation and goal setting. Studies 3a and 3b look at consumption choices at different levels of goal progress, testing our prediction that differences between outcomes just above (vs. below) a restraint goal are more motivating (H2). Study 4 examines goal specificity, testing our predictions that specific restraint goals will increase

satisfaction with the same outcomes (H3a) and tend to decrease motivation due to loss aversion (H3b). Lastly, Study 5 examines goal difficulty, testing our prediction that difficult restraint goals make marginal steps seem more impactful whereas difficult achievement goals have the opposite effect (H3c). Together, these studies provide empirical support for two key notions: that restraint goals serve as reference points with a graded value function and that applying the value function to restraint goals has important implications that differ substantially from prior findings.

4.4 Study 1

Study 1 tests our first hypothesis by empirically mapping the value function in a restraint goal context. In this study we asked participants to consider goal pursuit scenarios in one of two important and familiar goal domains: financial budgeting and time management. Participants evaluated how happy (or unhappy) they would be with various outcomes of pursuing a particular goal. In both domains, we predicted that responses would follow a mirrored form of the traditional S-shaped value function and that this mirrored value function would reflect both diminishing sensitivity and loss aversion.

4.4.1 Design and Method

Participants (N = 153) were recruited from Amazon Mechanical Turk in exchange for payment and assigned according to a 2 (goal domain) x 5 (outcome) mixed design. Participants were randomly assigned to one of two between-subjects conditions (goal domain: money, time) and each participant evaluated a series of five potential outcomes related to their assigned goal (within-subjects).

In the money-domain condition, participants read a scenario involving a goal to limit spending during a one-week period, where progress was measured by the amount of dollars spent (an undesirable action in this context):

“Alice sometimes buys coffee at Starbucks on the way to work. Last month, she decided to try and cut back on this wasteful spending. Alice set herself a budget of \$60 for the month for coffee. At the end of the month, she checked her credit card statement to see how much she had spent on coffee since setting her goal.”

Participants then each evaluated five possible outcomes: \$20, \$40, \$60, \$80, or \$100 total spending. They read, “How do you think she would feel if she was \$40 below her budget (she spent \$20 total)?” where both the relative and absolute dollar values were adjusted for each outcome, respectively. We measured responses on a sliding scale from -10 (very unhappy) to 10 (very happy). Each participant viewed all five outcomes (in increasing order) on one page of the questionnaire.

In the time-domain condition, participants read a scenario involving a goal to limit time spent on an unexpected work task, where progress was measured by how much extra time an individual needed to stay at the office (an undesirable action in this context):

“Alice typically leaves work at the same time each day. One day, something comes up at the end of the work day and she decides to take care of it before leaving. She stays late and aims to finish in another 45 minutes. After finishing up, Alice is ready to leave and she checks the time to see how much later it is than usual.”

Participants then evaluated five possible outcomes: staying 15, 30, 45, 60, or 75 minutes late. They read, “How do you think she would feel if she was 30 minutes ahead of her goal (15 minutes later than usual)?” where both the relative and absolute values were adjusted for each outcome, respectively. Like in the money-domain, we measured responses on a sliding scale from

-10 (very unhappy) to 10 (very happy). Each participants viewed all five outcomes (in increasing order) on the same page of the questionnaire.

4.4.2 Results

A 2 (domain) x 5 (outcome) mixed ANOVA on happiness ratings revealed a significant main effect of outcome level ($F(4, 148) = 239.43, p < .001$) and no main effect of domain ($F(1, 151) = 0.20, p = .655$). The model's interaction term was significant ($F(4, 148) = 10.07, p < .001$), but findings were substantively consistent across both domain conditions. Accordingly, the remainder of our analysis considers both domains jointly, although results are shown separately in figures 14 and 15 for ease of interpretation.

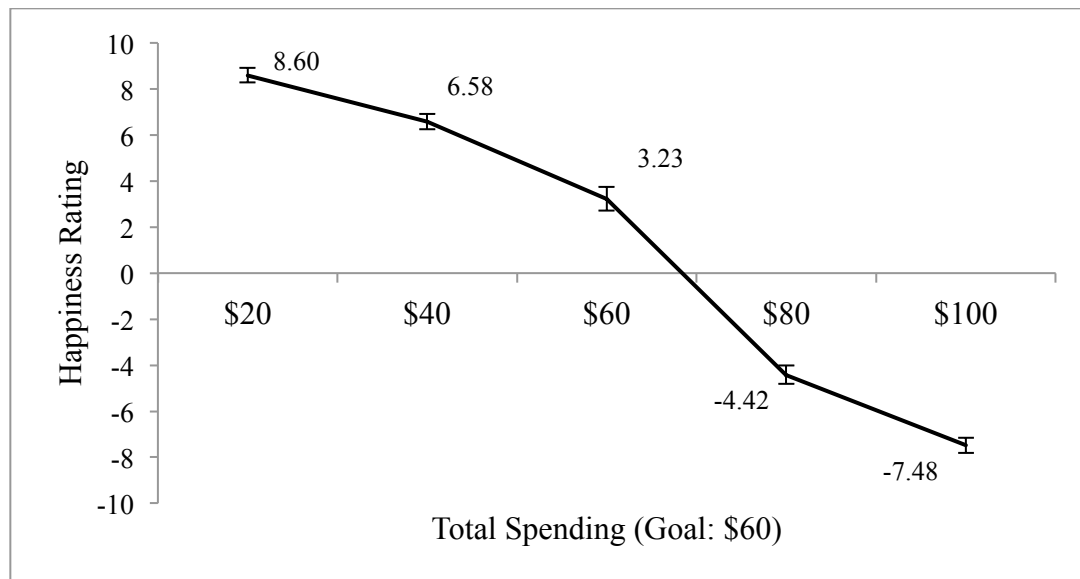


Figure 14. Average Ratings of Money Domain Outcomes in Study 1.

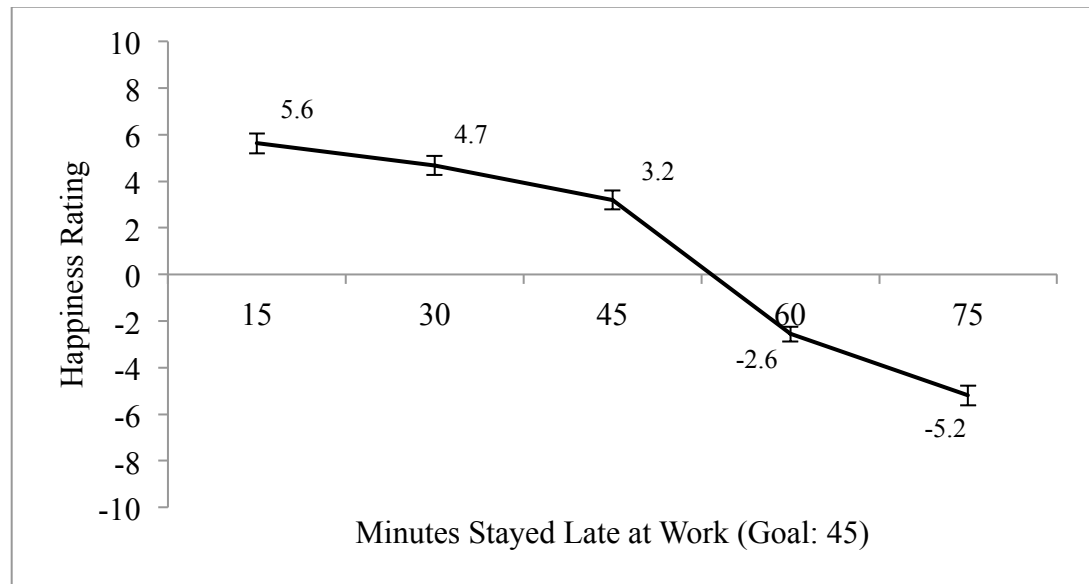


Figure 15. Average Ratings of Time Domain Outcomes in Study 1.

Loss Aversion. Results were highly consistent with loss aversion, which predicts a steeper slope on the loss (vs. gain) side of the value function. Accordingly, contrast tests revealed that the slope of the loss side of the value function (i.e., the difference between a large loss and meeting the goal exactly) was significantly greater than that of the gain side (i.e., the difference between a large gain and meeting the goal exactly) ($M_{large-loss} - M_{match} = -9.55$, $M_{match} - M_{large-gain} = -3.90$; $t(152) = 10.51$, $p < .001$). This result also held when looking only at the central part of the value function (i.e., matching the goal vs. a small gain/loss) ($M_{small-loss} - M_{match} = -6.70$, $M_{match} - M_{small-gain} = -2.42$; $t(152) = 8.82$, $p < .001$) or even when looking only at the outer part (i.e., a small gain/loss vs. a large one) ($M_{large-loss} - M_{small-loss} = -2.85$, $M_{small-gain} - M_{large-gain} = -1.48$; $t(152) = 4.08$, $p < .001$). In each case, results revealed that a change in outcomes on the loss side of the value function produced a greater change in evaluations than an equivalent change on the gain side.

Diminishing Sensitivity. Results were also consistent with diminishing sensitivity, which predicts a steeper slope near the reference point than far from it. Accordingly, contrast tests revealed that the slopes of the two segments proximal to the reference point (i.e., matching the goal vs. a small gain/loss) were steeper than the more distant ones (i.e., a small gain/loss vs. a large one). This result held for both the loss side of the value function ($t(152) = 9.46, p < .001$) and the gain side ($t(152) = 2.21, p = .029$). These findings are consistent with the prediction that consumers are more sensitive to a change in outcomes near the reference point (e.g., matching a budget vs. overspending by \$20) than they are to a change of equal magnitude further from the reference point (e.g., overspending by \$20 vs. \$40).

4.4.3 Discussion

Study 1 offers an initial look at restraint goals by using evaluations of multiple goal outcomes to map the value function. Consistent with our predictions and the tenets of Prospect Theory, results reveal that restraint goals produce a mirrored form of the traditional value function's S-curve and that this value function exhibits both diminishing sensitivity and loss aversion. Building on these findings, study 2 tests key aspects of the value function using real experiences of goal pursuit rather than scenarios.

4.5 Study 2

In this study we examine the value function and its key features in the context of a real restraint goal pursuit. We used participants' evaluations of their performance outcomes on an effortful, restraint goal-based lab task in order to empirically test our predictions about the role of restraint goals as reference points. In addition to looking at real rather than hypothetical goal pursuit experiences, this study also employed a between-subjects design to rule out any potential effects of joint (vs. separate) evaluation in study 1. Just as in study 1, we predicted that restraint

goals would create a mirrored value function exhibiting both diminishing sensitivity and loss aversion.

4.5.1 Design and Method

Participants (N = 205) were recruited from a university behavioral lab in exchange for course credit. In this and subsequent lab studies, lab capacity and participant availability determined the sample size. Participants were randomly assigned to one condition of a 4-level (outcome: 4, 6, 8, or 10 errors missed) between-subjects design.

Participants read that they would be proofreading a series of short text passages and that there were multiple spelling errors in each passage. Participants were informed that there would be 6 passages total and that they would be given 50 seconds to proofread each passage. To identify spelling errors, participants were instructed to retype all of the misspelled words in the current passage in a text box at the bottom of the page. All participants were assigned a goal to miss no more than six errors total over the course of the task (i.e., 6 passages). No performance feedback was given until the end of the task.

After the sixth passage, we manipulated performance outcomes by providing participants with false feedback about the number of errors they had failed to identify. We told participants that they had missed a total of 4, 6, 8, or 10 spelling errors in the task, by condition. These corresponded to a gain of two, matching the goal, a loss of two, or a loss of four, respectively. This study did not include a second, larger gain condition (e.g., only 2 errors missed) since lab resources were limited and these four conditions were sufficient to test both diminishing sensitivity and loss aversion.

Finally, we measured participants' evaluations of their performance outcomes. In all conditions, participants were asked, "Given that your goal was to miss no more than 6 spelling

errors, how happy or unhappy do you feel about missing [4, 6, 8, 10] errors?" Responses were measured on a sliding scale from -10 (very unhappy) to 10 (very happy).

4.5.2 Results

A 4-level (outcome) between-subjects ANOVA on happiness ratings revealed a significant effect of outcome level ($F(3, 201) = 40.95, p < .001$). Average ratings by outcome condition are shown in figure 16.

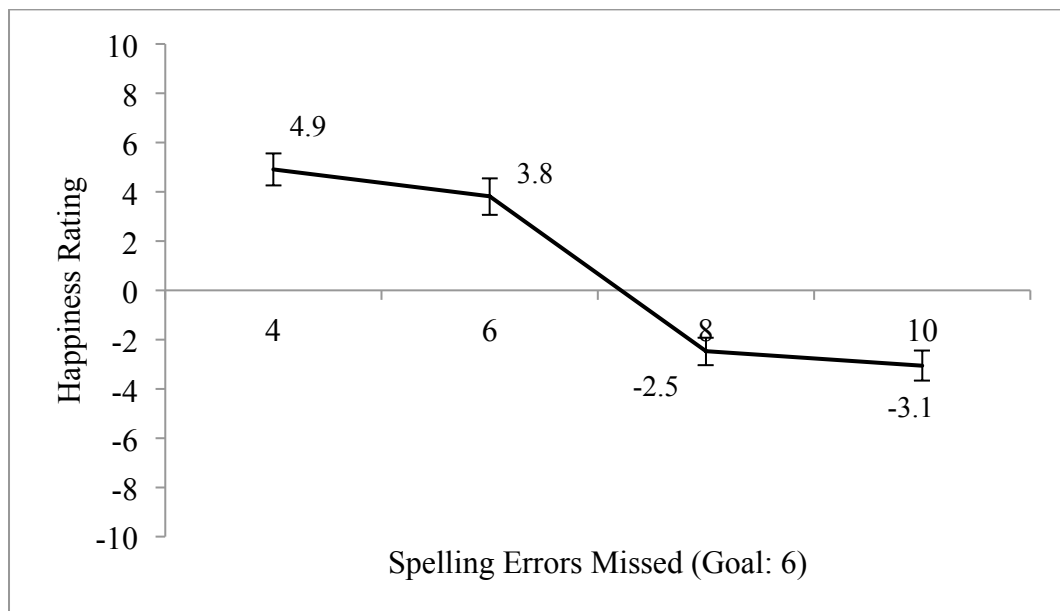


Figure 16. Happiness Ratings by Outcome Condition in Study 2.

Loss Aversion. Results were again highly consistent with loss aversion. Contrast tests revealed that the slope of the loss side of the value function (i.e., the difference between missing 6 and 8 errors) was significantly greater than that of the gain side (i.e., the difference between missing 4 and 6 errors) ($M_8 - M_6 = -6.29, M_6 - M_4 = -1.09; F(1, 301) = 10.97, p = .001$).

Consistent with Study 1 and with our predictions, a change in outcomes on the loss side of the

value function produced a greater change in evaluations than an equivalent change on the gain side.

Diminishing Sensitivity. Results were also consistent with diminishing sensitivity.

Contrast tests revealed that the slope of the segment closest to the reference point on the loss side (i.e., the difference between missing 6 and 8 errors) was steeper than the segment further from the reference point (i.e., the difference between missing 8 and 10 errors) ($F(1, 301) = 12.78, p < .001$). This result is consistent with the prediction that consumers are more sensitive to a change in outcomes near the reference point (e.g., matching the goal vs. exceeding it by 2) than they are to a change of equal magnitude further from the reference point (e.g., exceeding the goal by 2 vs. 4).

4.5.3 Discussion

Studies 1 and 2 empirically test the prediction that restraint goals act as reference points producing a value function consistent with the key tenets of Prospect Theory. In particular, these studies offer support for the hypothesis that this value function would have a mirrored appearance compared to the traditional S-shaped value function but still exhibit both diminishing sensitivity and loss aversion. The remaining studies build on these findings by exploring major implications of the value function and of restraint goals as reference points, highlighting several key divergences from prior achievement-goal findings. Study 3 examines consequences for motivation by testing a hypothesized reversal: that motivation is greater just after surpassing a restraint goal objective than before it. Finally, Studies 4 and 5 test several other consequences of restraint goals as reference points that diverge from prior findings, including effects of both goal specificity and goal difficulty.

4.6 Study 3a

This study looks at key behavioral effects of the mirrored value function revealed by Studies 1 and 2. Just as the traditional value function around achievement goals has substantial implications for goal-related behavior, we propose that the restraint goal value function has important (and very different) implications. This study tests some of those implications, particularly the notion that loss aversion should make the value function steeper, and thus motivation greater, when potential outcomes lie just above a restraint goal (e.g., just over budget) than just below it (e.g., just under budget). This predicted effect stands in stark contrast to the classic notion that motivation increases when approaching a goal and peaks just before it, then diminishes after the goal is achieved (for achievement goals, Heath et al. 1999) or failed (for restraint goals, cf. Soman and Cheema 2004; Cochran and Tesser 1996).

4.6.1 Design and Method

Participants (N = 165) were recruited from a university behavioral lab in exchange for course credit. Participants were randomly assigned to one condition of a 3-level (outcome: Just Below, Just Above, or Way Above the goal) between-subjects design.

Participants read about a scenario in which they had set themselves a budget of \$45 to buy their lunches over the course of a workweek (5 days). Participants then made a series of lunch choices for the first four days of the week (see Appendix F for stimuli details). Unknown to participants, prices of the lunch items were adjusted based on prior choices so that their cumulative spending entering “Day 5” reached a target amount, according to condition. On “Day 5,” we gave participants feedback about the total they had spent so far. Participants were told that they had spent \$33 (Just Below), \$38 (Just Above), or \$44 (Way Above) so far.

Next, participants saw two restaurant options for Day 5 with brief descriptions (see Appendix F for details). Participants were instructed that the expected cost of lunch at these restaurants was \$8 or \$11, respectively. Thus the lunch choice on Day 5 was a choice between total spending outcomes of \$41 versus \$44 (Just Below), \$46 versus \$49 (Just Above), or \$52 versus \$55 (Way Above), by condition. Based on the \$45 budget, these potential outcomes fell Just Below (\$1 or \$4 under budget), Just Above (\$1 or \$4 over budget), or Way Above the reference point (\$7 or \$10 over budget), respectively.

Finally, we asked participants to choose between the \$8 and the \$11 restaurant for lunch on Day 5. We predicted that the additional cost of the more expensive option would seem more or less impactful based on the position of the two outcomes on the value function.

4.6.2 Results

Results offered strong support for our predictions about the effects of the restraint goal value function on goal-related choices. Due to loss aversion in the value function around the \$45 budget, we predicted that participants in the Just Above condition would be more motivated to save the incremental \$3 (\$1 vs. \$4 over budget) than those in the Just Below condition (\$1 vs. \$4 under budget). Results confirmed that those in the Just Above condition were significantly more likely to choose the inexpensive lunch option ($P = 88\%$) than those in the Just Below condition ($P = 50\%$; $X^2 = 34.64, p < .001$).

Due to diminishing sensitivity in the value function, we predicted that participants in the Just Above condition would be more motivated to save the incremental \$3 (\$1 vs. \$4 over budget) than those in the Way Above condition (\$7 vs. \$10 over budget). Results confirmed that those in the Just Above condition were significantly more likely to choose the inexpensive lunch option ($P = 88\%$) than those in the Way Above condition ($P = 78\%$; $X^2 = 4.66, p = .031$).

4.6.3 Discussion

Study 3 empirically tests key implications of the restraint goal value function on goal-related consumer decisions. Results reveal the influence of both loss aversion and diminishing sensitivity, supporting our predictions and the findings of the previous studies. Consistent with loss aversion, participants were more motivated by a \$3 difference in prices when that \$3 difference was between two outcomes on the loss side of the value function than when that difference fell on the gain side. In addition, consistent with diminishing sensitivity, participants were more motivated by a \$3 difference between two outcomes just above the budget than by the equivalent price difference further above the budget.

These results are consistent with our predictions about the value function and also help to rule out key alternative explanations. In particular, a goal-highlighting explanation could attribute the apparent effect of loss aversion to an increase in motivation following negative progress feedback (Carver and Scheier 1990). However, such a mechanism would not predict a reversal of this effect in the Way Above condition, where even stronger negative feedback actually leads to lower motivation among our participants. In contrast, the value function provides a unified model that explains why consumers would show an increase in motivation just above the budget (i.e., crossing from gains into losses) but a subsequent decrease in motivation when they move further beyond the budget (i.e., further from the reference point). Building on these findings, study 3b seeks to replicate these findings in a non-financial domain, addressing potential idiosyncrasies of study 3a's paradigm to ensure the generality of its findings.

4.7 Study 3b

This study looks again at the behavioral effects of the restraint goal value function, seeking to replicate the findings of study 3a in a novel domain and with an adjusted study

paradigm. This study differs from study 3a in two key ways. First, whereas the prior study looked at financial budgeting, this study considers goals to restrict caloric consumption. Previous literature has documented a “what-the-hell” effect (Cochran and Tesser 1996), particularly in the context of caloric restriction, which reduces motivation after a restraint goal is exceeded – a direct contrast to our predictions about loss aversion. By testing our predictions in this domain, study 3b offers a clearer comparison to this prior work and also potentially a more conservative test of the predicted effect. The second key difference from study 3a is that one of the potential outcomes of the focal choice is equal to the current level of progress. This alleviates any concern about the fact that participants’ current progress in study 3a (e.g., \$38 spent in the Just Above condition) was not on the same part of the value function as the potential choice outcomes (e.g., \$46 or \$49 spent in the Just Above condition).

4.7.1 Design and Method

Participants (N = 186) with a goal to maintain or reduce their current weight were recruited from a university behavioral lab in exchange for course credit. Participants were randomly assigned to one condition of a 3-level (outcome: Just Below, Just Above, or Way Above the goal) between-subjects design.

Participants read about a scenario in which they had set themselves a calorie limit of 2000 calories for a particular day. Participants then made a series of three meal choices for that day’s breakfast, lunch, and dinner from fictional menus (see Appendix G for stimuli). No calorie information was included on the menus. After completing all three meal choices, participants were given false feedback indicating how many total calories they had eaten in these three meals, according to their assigned outcome condition. Participants were told that they had eaten 1700 (Just Below), 2050 (Just Above), or 2500 (Way Above) calories so far.

Next, participants read that after dinner they were meeting with a group of friends to celebrate one friend's birthday. At this gathering, they had the option to have a piece of birthday cake, adding 250 calories to their total for the day. Participants were given a binary choice of whether or not to have the cake. Based on their current progress, this constituted a choice between total calorie outcomes of 1700 versus 1950 (Just Below), 2050 versus 2300 (Just Above), or 2500 versus 2750 (Way Above) in each respective condition. Based on the 2000-calorie goal, these potential outcomes fell Just Below (50 or 300 calories short), Just Above (50 or 300 calories over), or Way Above the reference point (500 or 750 calories over), respectively. We predicted that the cake's 250 calories would seem more or less impactful based on the position of the two potential outcomes on the value function.

4.7.2 Results

Results again supported our predictions about the effects of the restraint goal value function on goal-related choices, replicating the findings of study 3a. Due to loss aversion in the value function around the 2000-calorie goal, we predicted that participants in the Just Above condition would be more motivated to avoid the incremental 250 calories than those in the Just Below condition. Results confirmed that those in the Just Above condition were significantly more likely to choose *not* to have the piece of cake ($P = 73\%$) than those in the Just Below condition ($P = 24\%$; $X^2 = 29.42, p < .001$).

Due to diminishing sensitivity in the value function, we predicted that participants in the Just Above condition would be more motivated to avoid the incremental 250 calories than those in the Way Above condition. Results showed that those in the Just Above condition were directionally but not significantly more likely to choose *not* to have the piece of cake ($P = 73\%$) than those in the Way Above condition ($P = 63\%$; $X^2 = 1.51, p = .219$).

4.7.3 Discussion

Study 3b replicates the findings of study 3a in the context of caloric restriction, shedding further light on how the restraint goal value function influences motivation and consumption. Critically, this study offers further support for the predicted effects of loss aversion in producing greater motivation just above a restraint goal objective than an equal distance below it. Secondly, study 3b shows a slight directional effect of diminishing sensitivity that, while not reaching statistical significance, helps to rule out a pure discrepancy model as an alternative explanation for the effect of loss aversion (Carver and Scheier 1990). This extends the findings of the previous studies to the context of caloric restriction, a domain where prior work has proposed a “what-the-hell” effect in the opposite direction of the effect of loss aversion (Cochran and Tesser 1996). This speaks to the generality of our findings and also raises interesting questions as to the relationship between these competing mechanisms and the circumstances in which one versus the other might predominate (see General Discussion). Studies 4 and 5 build on these findings by examining additional implications of the restraint goal value function for judgments, motivation, and effective goal-setting.

4.8 Study 4

Study 4 tests additional behavioral implications of the restraint goal value function, with a particular focus on the effects of goal specificity. Prior work on achievement goals as reference points has shed substantial light on the effects of goal specificity on both satisfaction and motivation (Heath et al. 1999; Wallace and Etkin 2018). This study tests our prediction that the effects of specificity will play out very differently in restraint goal contexts due to the mirrored form of the value function. In particular, study 4 tests the predictions that, in direct contrast to the

effects of specific achievement goals, specific (vs. do-your-best) restraint goals will tend to increase outcome satisfaction and decrease consumer motivation.

4.8.1 Design and Method

Participants (N = 180) were recruited from Amazon Mechanical Turk in exchange for payment. Each participant was randomly assigned to one of three “choice problems.” These problems were adapted from those Heath and colleagues (1999) used to demonstrate the implications of the value function. For example, the authors of that paper illustrated the notion that specific (achievement) goals tend to decrease satisfaction with the same (or even objectively better) performance outcomes using the following choice problem (*Problem 2*):

“Alice typically scores around 80 on weekly 100-point quizzes in one of her classes. One week she sets a goal of scoring 90. She scores 87. Betty typically scores around 80 on weekly 100-point quizzes in one of her classes. One week she decides to do her best. She scores 83. Overall, who will be more satisfied with her performance?” The authors report that the 60 participants they presented this problem to significantly favored Betty. This result supported their prediction that using her specific goal as a reference point would make Alice less satisfied than Betty, even though Alice performed objectively better.

In the present study, our Problems 1 and 2 explore similar comparisons in the context of restraint goals, where we make the opposite prediction: using a specific restraint goal (vs. do-your-best goal) as a reference point will *increase* satisfaction. Building on this, Problem 3 compares the motivation of someone with a specific versus a do-your-best goal, testing our prediction that specific restraint goals will tend to decrease motivation by putting goal pursuers on the gain side of the value function (cf. HLW *Problem 4*).

4.8.2 Results (Problem 1)

Problem 1 explored our prediction that consumers with specific restraint goals (vs. do-your-best goals) would be more satisfied with the same objective outcomes. In this case, we looked at restraint goals in the context of financial budgeting. Participants assigned to this choice problem read the following:

“Last year, Alex and Brian spent similar amounts of money buying coffee at Starbucks on the way to work. They have both made New Years resolutions to cut back. Alex set a personal goal to spend \$12 or less buying coffee last week. He ended up spending \$10 on coffee. Brian set a personal goal to spend as little as possible buying coffee last week. He ended up spending \$10 on coffee. Overall, who do you think is more satisfied with his performance last week?”

Results strongly supported our prediction of a reversal from prior findings in achievement goal domains. Out of 61 participants, 55 (90%) indicated that Alex would be more satisfied. This response rate differed significantly from 50% ($\chi^2 = 39.36, p < .001$).

4.8.3 Results (Problem 2)

Problem 2 again explored our prediction that specific restraint goals (vs. do-your-best goals) would increase satisfaction. Conceptually replicating Problem 2, we turned to the context of time management. Participants assigned to this choice problem read the following:

“Last year, Alice and Betty each spent a lot of time watching reality TV. They have both made New Years resolutions to cut back. Alice set a personal goal of watching 10 hours or less last week. She ended up watching 8 hours. Betty set a personal goal of watching as little reality TV as possible last week. She ended up watching 8 hours. Overall, who do you think is more satisfied with her performance last week?”

Results replicated our findings from Problem 1, again offering support for our prediction. Out of 60 participants, 56 (93%) indicated that Alice would be more satisfied. This response rate differed significantly from 50% ($X^2 = 45.07, p < .001$).

4.8.3 Results (Problem 3)

Problem 3 built on the first two choice problems by examining implications for motivation. In particular, we hypothesized that specific restraint goals would tend to decrease motivation (vs. do-your-best goals) because they put goal pursuers on the gain side of the value function. Again, this prediction constitutes a reversal from prior findings in achievement goal contexts. To test this prediction, we returned to the context of financial budgeting. Participants assigned to this choice problem read the following:

“Charlotte and Donna both tend to go out for lunch instead of bringing their own food to eat on their lunch breaks at work, and both of them would like to go out less in order to save some money. To try and cut back, Charlotte sets herself a budget of \$40 for buying lunch one week. On that Friday morning, she is running late and trying to decide between packing a lunch for the day and going out to buy lunch somewhere. She has spent \$20 on lunch so far that week. Donna is also trying to cut back, and she sets herself a goal to spend as little money as possible on buying lunch one week. On that Friday morning, she is running late and trying to decide between packing a lunch for the day and going out to buy lunch somewhere. She has spent \$20 on lunch so far that week. Who do you think is more likely to take the time to pack a lunch for the day?”

Results offered support for our prediction that a specific restraint goal would decrease motivation. Out of 59 participants, 39 (66%) indicated that Donna would be more likely to spend time packing her lunch in order to avoid spending more money. This response rate differed significantly from 50% ($X^2 = 6.12, p = .013$).

4.8.4 Discussion

Study 4 finds empirical support for our prediction that some of the key consequences of goal specificity are reversed in the context of restraint goals. In particular, results support the predictions that specific (vs. do-your-best) restraint goals make consumers feel more satisfied with the same objective outcomes and also make consumers generally less motivated by placing them on the gain side of the value function. Building on these new insights into the role of goal specificity in restraint goal-setting, study 5 turns to the question of goal difficulty, highlighting how the mirrored value function alters the relationship between goal difficulty and consumer motivation.

4.9 Study 5

Study 5 explores another important implication of thinking of restraint goals as reference points. Prior goal-setting research suggests that challenging goals generally enhance performance. However, research on goals as reference points suggests that, in achievement goal contexts, these challenging (i.e., high magnitude) goals may undermine motivation in some cases by establishing a more distant reference point. For example, someone aiming to save up \$100,000 may find herself less motivated than someone aiming for \$10,000 because each step of progress (i.e., marginal dollar saved) appears to have very little impact. As outlined in hypothesis 3c above, we propose that this same tradeoff will not emerge for restraint goals. Because lower-magnitude restraint goals are actually more stringent (e.g., a \$50 vs. \$100 budget), challenging restraint goals will actually tend to make marginal steps of progress feel *more* impactful and thus *increase* motivation via the value function. In study 5, we explore these predictions by looking at goal difficulty in two parallel scenarios focused on achievement and restraint goals, respectively.

4.9.1 Design and Method

Participants (N = 154) were recruited from a university behavioral lab in exchange for course credit. Each participant was randomly assigned to one of two conditions (goal type: achievement, restraint). In both conditions, participants were presented with scenario-based choice problems like those in Study 4. Each participant responded to two choice problems based on the same scenario.

In the achievement goal condition, participants read about two individuals (Jim and Kyle) who have regular exercise programs. Both Jim and Kyle have goals related to the number of extra workouts they will do this month beyond their planned program (a desirable action). Participants in the achievement goal condition read the following:

“Jim [Kyle] has had a regular exercise program for a few months and he wants to add some additional workout days next month. He sets a goal to add 9 [5] extra workouts to his routine in the next month. Whose goal is more difficult?” After reading and responding to this first part of the scenario, achievement goal participants then read the following:

“Later in the month, Jim and Kyle have each managed to fit in 3 extra workouts so far. Looking at the remainder of the month, each of them finds that his schedule only leaves room for 1 more extra workout, for a total of 4 extra workouts this month. Who do you think will see the one remaining chance for an extra workout as more valuable?”

In the restraint goal condition, participants also read about Jim and Kyle. However, in this condition Jim and Kyle both have goals related to the number of workouts they will miss this month in their planned program (an undesirable action). Participants in the restraint goal condition read the following:

“Jim [Kyle] has had a regular exercise program for a few months but he sometimes misses some of his planned workouts. He wants to do a better job of not skipping workouts next month, so he sets himself a goal to skip no more than 9 [5] of his scheduled workouts over the course of the month. Whose goal is more difficult?” After reading and responding to this first part of the scenario, restraint goal participants then read the following:

“Later in the month, Jim and Kyle have each skipped 3 workouts so far. Looking at the remainder of the month, each of them finds that there is only 1 more scheduled workout that he would think about skipping, for a total of 4 skipped workouts this month. Who do you think will see the one additional skipped workout as more of a problem?”

4.9.2 Results

Achievement Goal Scenario. For achievement goals, we predicted that Jim’s higher magnitude goal (9 vs. 5 extra workouts) would be seen as more difficult, and that Kyle’s (easier) goal would make the next workout seem more valuable. Results supported this prediction. Out of 77 participants, 74 (96%) indicated that Jim’s goal was more difficult on the first question. On the second question, 54 (70%) indicated that Kyle would see the additional workout as more valuable. These response rates differed significantly from 50% on the first question ($X^2 = 65.23, p < .001$) and, in the opposite direction, on the second ($X^2 = 12.48, p < .001$).

Restraint Goal Scenario. For restraint goals, we predicted that Jim’s higher magnitude goal (9 vs. 5 skipped workouts) would be seen as *less* difficult, and that Kyle’s (harder) goal would make the next workout seem more valuable. Results were highly consistent with this prediction. Out of 77 participants, 67 (87%) indicated that Kyle’s goal was more difficult on the first question. On the second question, 72 (94%) indicated that Kyle would see the additional

workout as more valuable. These response rates differed significantly from 50% on the first question ($X^2 = 42.19, p < .001$) and, in the *same* direction, on the second ($X^2 = 58.30, p < .001$).

4.9.3 Discussion

Results of study 5 support the prediction that the relationship between goal difficulty and motivation plays out differently for restraint versus achievement goals. Specifically, this study shows that difficult restraint goals place goal pursuers on a steeper part of the value function and thus enhance motivation, whereas difficult achievement goals have the opposite effect.

4.10 General Discussion

The present research examines the consequences of restraint goals as reference points. Leveraging the key tenets of Prospect Theory, we consider how these properties will apply to restraint goal domains (e.g., budgeting, dieting, time management) and develop a series of hypotheses about the restraint goal value function and its implications for satisfaction, motivation, and effective goal-setting.

4.10.1 Theoretical Contributions

This work makes three main contributions to related literature. First, it provides valuable insight into the setting and pursuit of restraint goals, demonstrating novel divergence from other goal domains. Just as prior work has shown the value of distinguishing between approach and avoidance motivation (Elliot 2006) or between promotion and prevention focus (Brendl and Higgins 1996), the present research reveals a valuable distinction between achievement and restraint goals. We define restraint goals as goals to restrict or limit a behavior, where the key metric of performance is the accumulation of undesired steps toward a budget or limit (e.g., dollars spent, workouts skipped). Although these goals may coincide with avoidance motivation

or a prevention focus, they are conceptually distinct. As study 5 illustrates, behavior typically associated with approach motivation (i.e., working out) can be managed with either an achievement or a restraint goal, depending whether performance is measured primarily based on the accumulation of desired (workouts completed) or undesired (workouts skipped) steps of progress. In addition, whereas a regulatory focus on prevention versus promotion is sensitive to individual interpretation and mindset, we categorize goals as restraint or achievement based on their structure and framing. So, for example, a shopper with a spending budget in mind is pursuing a restraint goal, though he may have either a prevention or a promotion focus, depending on whether he is focused on the possibility of exceeding versus staying under his budget, respectively.

Translating the model of goals as reference points to the context of restraint goals, we find that this framework has very different implications in this context than in the goal domains that have previously been investigated. These implications include the dynamics of motivation, the hedonic and motivational effects of goal specificity, and the effects of setting easy versus difficult goals. In each case, we predict and demonstrate meaningful differences between restraint and achievement goals.

The second major contribution of this research is to shed light on the distinct implications of Prospect Theory for restraint goals, contributing to literature on reference points and related judgment processes. We identify key similarities and differences between restraint and achievement goals, proposing and empirically documenting a mirrored value function for restraint goals. This extends the theory of goals as reference points to contexts previously framed as “all-or-nothing” goals (Cochran and Tesser 1996; Soman and Cheema 2004), demonstrating that restraint goal pursuers’ judgments do in fact follow a graded value function that distinguishes between outcomes in a non-binary way. Our findings illustrate not only that Prospect Theory’s

value function is applicable to restraint goals but also that it has distinct and novel implications in that context. This extension of the goals-as-reference points theoretical framework adds to a stream of recent work extending the same framework to non-specific goals (Wallace and Etkin 2018) and to evaluations of multiple goal outcomes (Weingarten et al., working paper).

This work also contributes to literature on consumer budgeting and mental accounting. It connects this topic area to relevant insights from both Prospect Theory and goals research, and also identifies important differences in how those insights apply to budgeting and related behaviors.

4.10.2 Implications for Marketers and Consumers

In addition to its theoretical contributions, the present research also has implications for consumers and marketers. First, by identifying the mirrored value function for restraint goals, this work can help consumer and marketers to be more aware of how restraint goals might shape satisfaction and motivation. This could enable strategic use of such goals to influence satisfaction and motivation, or the use of alternative interventions (e.g., framing of feedback) to counteract predictable distortions.

Another important implication of this work is the insight that, for restraint goals, setting specific goals actually increases satisfaction with goal outcomes. Counter to related findings for achievement goals, this suggests that consumers might be able to set specific restraint goals for themselves in order to make goal pursuit more enjoyable and decrease stress. This also suggests the possibility that specific restraint goals can increase future re-engagement with the same behavior by enhancing feelings of accomplishment, much like prior work has found that range goals do (Scott and Nowlis 2013). On the other hand, this work reveals novel drawbacks of setting specific goals in restraint domains: alongside its hedonic benefits, setting specific goals puts restraint goal pursuers on a shallower part of the value function and could thus undermine

motivation. This suggests that, contrary to standard advice from achievement domains, many individuals may perform better with do-your-best goals.

The present findings also indicate that the tradeoffs involved in determining optimal goal difficulty play out differently in restraint versus achievement contexts. More specifically, we find that difficult restraint goals don't undermine the perceived impact of incremental progress. This finding favors setting more challenging goals in restraint domains, since increased difficulty does not increase the distance to the reference point. On the other hand, excessively difficult restraint goals could turn out badly if many consumers fly past them and lose motivation due to perceptions of total failure (i.e., "what-the-hell" effect, Cochran and Tesser 1996; Soman and Cheema 2004).

4.10.3 Opportunities for Future Research

In addition to its direct contributions and implications, this research also points to several promising opportunities for future research. The first is an opportunity to better understand the antecedents of specific goal-setting. Although the diverging consequences of specific versus non-specific goals have been studied extensively, very little work examines factors determining which type of goal consumers will adopt. The present findings indicate that pursuing specific (vs. do-your-best) goals has very different effects on satisfaction and motivation in restraint domains versus in achievement domains. To the extent that these anticipated effects are factors in the goal-setting process, these findings suggest that consumers' propensity to adopt specific goals may differ across these domains. One possibility is that consumers are more likely to set specific goals in restraint domains than in achievement domains because specific achievement goals carry a hedonic cost (i.e., decrease satisfaction) and specific restraint goals bring a hedonic benefit (i.e., increase satisfaction). Alternatively, if goal-setting is more of a strategic process to enhance

motivation, consumers may be more likely to set specific goals in achievement domains than in restraint domains, since the former more strongly enhances motivation.

The present findings also point to the question of how difficult goals should be in restraint domains. The question of optimal goal-setting is a crucial one, and our findings shed new light on this issue. Whereas increased difficulty of achievement goals (i.e., increased magnitude) can sometimes undermine motivation due to diminishing sensitivity, this tradeoff does not emerge when the difficulty of restraint goals increases (i.e., magnitude decreases). At the same time, although our findings show an increase in motivation immediately above a restraint goal objective due to loss aversion (studies 3a and 3b), they also suggest a subsequent decline in motivation due to diminishing sensitivity. This points to a motivational penalty for substantially exceeding a restraint goal objective, consistent with related work on the “what-the-hell” effect (Cochran and Tesser 1996). This potential downside of exceeding the goal objective, paired with the motivational benefit of setting difficult (i.e., lower-magnitude) restraint goals, creates a new goal-setting tradeoff unique to the restraint goal context. Empirically testing the balance between these factors to define the optimal difficulty for restraint goal-setting could be a fruitful avenue for future study.

Lastly, the present research raises interesting questions about consumer motivation immediately above a restraint goal objective (e.g., over a budget). Whereas prior work predicts a “what-the-hell” effect that dramatically decreases motivation (Cochran and Tesser 1996; Soman and Cheema 2004), we argue that loss aversion predicts the opposite effect and find empirical evidence of an increase in motivation just above a restraint goal (studies 3a and 3b). One possibility is that research on the “what-the-hell” effect has looked at motivation when goal pursuers are far enough beyond the goal objective that diminishing sensitivity offsets the effects of loss aversion. However, the relatively weak effects of diminishing sensitivity (vs. loss

aversion) in our studies suggest this is not the dominant explanation. Another possibility is that the “what-the-hell” effect is driven (or strengthened) by contextual factors that play a limited role in our studies, such as large material or psychological incentives associated with goal success versus failure (vs. our “mere goal” manipulations). Future work could more deeply examine these contrasting predictions to understand when and why each mechanism predominates.

This research explores the consequences of goals as reference points in the context of restraint goals such as personal budgeting, dieting, and time management. Drawing on relevant theory from the context of achievement goals, we develop a series of hypotheses about how fundamental differences in the restraint goal domain will influence the value function, consumer satisfaction, consumer motivation, and the goal-setting process. Empirical findings offer support for our predictions, shedding new light on the influence of restraint goals as reference points. These findings make valuable contributions to theory and also suggest numerous implications for the use of restraint goals by consumers and marketers.

5. Conclusion

Goals play an integral part in consumer behavior, and setting goals in different ways can have substantial consequences for subsequent behavior. Structuring the same basic goal in different ways can influence goal adoption, commitment, perceived importance, goal revision, motivation dynamics, performance outcomes, satisfaction with performance, and future goal reengagement. Understanding these effects and balancing them effectively can help consumers succeed in their personal and career endeavors, help policymakers to encourage desired behaviors, and help marketers to excite and engage customers.

This dissertation offers valuable new insights into the consequences of goal structure by considering the influence of salient reference points during consumer goal pursuit. This approach sheds light on how consumers think about their progress and about the value of subsequent goal-related actions while pursuing goals structured in various ways. By addressing these questions, this research is able to examine the dynamics of affect and motivation during goal pursuit in compelling and previously unexplored ways.

Three essays test the implications of this process for the dynamics of affect and motivation during consumer goal pursuit. Essay 1 examines how differences in reference point focus produce dynamic motivational effects of goal specificity. Essay 2 examines the strategies consumers adopt for focusing and shifting their attention

between the dual end-state reference points of a range goal, and how those strategies drive performance outcomes. Essay 3 examines how the relationships between goal structure, reference points, affect, and behavior play out differently in restraint versus achievement goal domains. Each of these investigations makes novel and substantial contributions to understanding of goal pursuit, with myriad implications for marketers and consumers. In addition, the findings of these essays also point to promising new avenues for future investigation. Although some of these opportunities are discussed within the respective essays, I will also highlight some overarching topics for future study below.

5.1 Future Direction: Range Restraint Goals

The present work offers new insights into both the pursuit of range goals (Essay 2) and the pursuit of specific and non-specific goals in restraint domains (Essay 3). The convergence of these two factors – the pursuit of range restraint goals – remains an open question for future study. For example, how might a shopping budget of \$120-\$150 influence behavior differently from a specific budget?

There is reason to believe that the meaning and consequences of range goals will be quite different in restraint domains from what has thus far been documented in achievement domains. Critically, whereas the lower end of the range is the minimum cutoff for success in achievement domains, the upper end is the cutoff between success

and failure in restraint domains. This is likely to alter which one people use to assess attainability versus difficulty when evaluating a range goal (Scott and Nowlis 2013).

Building on the current research, this difference in the meaning of the range endpoints may also affect range goal pursuers' strategies for directing and shifting their reference point focus. One possibility is that individuals who tend to focus on the upper endpoint in achievement domains will instead focus on the lower endpoint in restraint domains, and vice versa. Another possible consequence is that the switching strategy will not occur, or it will play out very differently. Whereas switching from the lower to the upper endpoint means switching from the easier to the more difficult target in achievement domains, it means the reverse in restraint domains. If this lower-upper switch still occurs in restraint domains, it will act as more of a "fallback" or emergency reserve strategy. If switching instead continues to favor increased difficulty even for restraint goals (i.e., upper-lower switch), it is unclear when or why such a switch would occur, or what it would mean for performance.

5.2 Future Direction: Antecedents of Goal Specificity

Another opportunity for future investigation is to explore the antecedents of goal specificity. Although prior work has dealt with specificity extensively, nearly all of this work (including the present dissertation) focuses on the consequences of setting goals in different ways. Conversely, most work looking at the antecedents of goal setting has

looked at effects on goal difficulty rather than specificity. The very limited body of work treating goal specificity as a dependent variable has done so through surveys of personality and goal-setting tendencies, and even then only in workplace contexts (Barrick, Mount, and Strauss 1993).

A promising opportunity for future research would be to examine this question more deeply, developing a new theoretical framework for understanding goal setting and goal specificity. Such a framework could incorporate many relevant psychological factors. To the extent that setting specific goals involves imagining and planning for the future, it may be influenced by individuals' propensity to plan (Lynch et al. 2010), their perceived connection to the future self (Bartels and Rips 2010), or the degree to which they discount future events relative to the present (Soman et al. 2005). To the extent that setting a specific goal means decreasing present (and near future) satisfaction for the sake of achieving better future outcomes, it could be considered an act of self-control influenced by both chronic self-control (Tangney, Baumeister, and Boone 2004) and current self-regulatory resources (Muraven and Baumeister 2000). To the extent that goal specificity is a reflection of the goal pursuer's certainty about the future, it may be influenced by generalized feelings of control (Cutright, Bettman, and Fitzsimons 2013), by locus of control (Phares 1976), or by familiarity with the particular domain.

5.3 Future Direction: Goal-Setting as Reference Point Selection

One important question in literature on reference points and decision-making is how consumers prioritize or combine multiple competing reference points to produce a single reference point. Prior research on this phenomenon has suggested that reference point focus can be based on proximity (Bonezzi et al 2011; Carton et al. 2011; March and Shapira 1992), on environmental cues (Bonezzi et al. 2011; Cheema and Bagchi 2011; Koo and Fishbach 2012), or on a weighted combination of salient values (Baucells et al. 2011). Essay 2 speaks to this question in the case of range goals, finding evidence of proximity-based focus with a forward-looking bias (i.e., a switching strategy) but also highlights heterogeneity in patterns of focus across individuals.

Further examining this question of how consumers choose or combine available reference points could shed new light on many aspects of goal setting that are currently obscure. This question points to the fundamentally novel approach of considering goal setting as the decision to adopt one of a set of salient points as the focal reference point. Much like other types of consumer choice, this would likely involve a two-stage process to generate a choice set (i.e., recruit candidate goals from memory and from the environment) and then to select a preferred option. Prior work offers some indication that such a process might be occurring, such as research showing that round numbers are often adopted as goals (Pope and Simonsohn 2011; Allen et al. 2016). Exploration of this phenomenon might reveal that important biases from other types of choice (e.g.,

priming, anchoring-and-adjustment, decoy effects) are also present in consumer goal setting. This may also shed light on the antecedents of goal specificity, both compared to nonspecific “do-your-best” goals and compared to range goals. Regarding nonspecific goals, this approach points to a novel interpretation of these goals as a type of choice deferral (i.e., not choosing a salient reference point to become the goal objective), which may have psychological antecedents in common with other such deferrals. Regarding range goals, this approach reinterprets these goals as a pair of end-state objectives. This framing suggests that range goals might arise from the presence of two salient reference points rather than a “confidence interval” for performance (see Essay 2, General Discussion). More broadly, considering goal setting as a choice of reference points may reveal numerous ways in which salient reference points might be created or highlighted in order to encourage goal setting, influence goal structure, and optimize subsequent performance.

5.4 Concluding Remarks

Goals play a critical role in consumers’ lives, but consumers frequently struggle and fail in their personal pursuits. One way of tackling this problem is to develop strategies for setting goals that enhance commitment, motivation, or satisfaction with the goal pursuit process. This may mean setting a more or less difficult goal, setting a target range rather than a specific goal, or in some cases simply aiming to “do your best.” How

best to structure goals has long been a key question in goals research. Although prior research in this area has proven fruitful, many questions about the influence of goal structure on the goal pursuit process remain unresolved. This dissertation sheds light on many of these unresolved questions, particularly regarding the motivational dynamics of goal pursuit. In three essays, I illustrate how thinking about goal structure in terms of the reference points that are salient in the goal pursuer's mind can offer novel insights into the psychology of goal pursuit. These essays empirically test key implications of this paradigm while also opening up numerous promising avenues for future investigation. Together, the findings of this research and the opportunities it presents for future inquiry provide an exciting contribution to goals research and valuable insights for helping consumers lead successful, healthy, and happy lives.

Appendix A. Essay 1 Goal Calibration Pretests

Calibration of Loan Payment Goal (Studies 2 and 4a)

Method. Pretest participants were recruited from Amazon Mechanical Turk in exchange for small payment ($N = 130$, average age = 34.05 years, 40.8% female). They read the loan payment scenario from Study 2, omitting any reference to the goals or goal progress to avoid biasing responses. We asked participants how much debt they would aim to pay off in one month if they were setting a goal for themselves (open-ended in dollars).

Results. The average self-generated debt repayment goal was \$565.77 ($SD = 1015.72$). This confirms that the specific goal assigned in Studies 2 and 4a (pay off \$500 of debt) is aligned with participants' natural aspiration level and appropriately calibrated for the study. The average self-generated debt repayment goal was also greater than the high goal progress level (\$450), indicating that participants in the non-specific goal condition who received the high goal progress feedback were unlikely to infer that they had already achieved the goal.

Calibration of Weight Loss Goal (Studies 3 and 4b)

Method. Pretest participants were recruited from a university behavioral lab in exchange for course credit ($N = 27$, average age = 22.93 years, 59.3% female). They read the weight loss scenario from Study 3, omitting any reference to specific goals or goal progress to avoid biasing responses. We asked participants how many pounds they would aim to lose in eight weeks if they were setting a goal for themselves (open-ended in pounds).

Results. The average self-generated weight loss goal was 9.58 pounds ($SD = 7.07$). This confirms that the specific goal assigned in Studies 3 and 4b (lose 6 pounds) is below participants' natural aspiration level and thus could not be artificially inflating their

target. The average self-generated weight loss goal was also greater than the high goal progress level (4.5 pounds lost in Study 3 and 5 pounds lost in Study 4b), indicating that participants in the non-specific goal condition who received the high progress feedback were unlikely to infer that they had already achieved the goal.

Appendix B. Essay 1 Goal Progress Manipulation Pretests

Progress Pretest for Loan Payment Goals (Studies 2 and 4a)

Method. Pretest participants were recruited from Amazon Mechanical Turk in exchange for small payment ($N = 292$, average age = 33.88 years, 37.3% female). Participants were randomly assigned to one condition in the same 2 (goal specificity: specific, non-specific) x 3 (goal progress: low, intermediate, high) between-subjects design used in Study 2.

To verify the effect of our progress manipulation, we measured goal progress perceptions using two measures: “At this point, how much progress would you feel you had made?” (1 = *A little*, 7 = *A lot*) and “At this point, how much money would you feel you had saved to put toward your loans for the month?” (1 = *A little*, 7 = *A lot*). These items were highly correlated ($r = .89$) and combined.

Results. A 2 (goal specificity) x 3 (goal progress) ANOVA on perceived goal progress revealed a main effect of goal specificity ($F(1, 286) = 12.17, p < .001$), such that overall, participants in the specific goal condition perceived greater goal progress than did those in the non-specific goal condition ($M_{\text{non-specific}} = 3.20$ vs. $M_{\text{specific}} = 3.76$).

Importantly, this analysis also revealed the expected main effect of goal progress ($F(2, 286) = 165.83, p < .001$). Confirming that the manipulation worked as intended, in the specific goal condition, perceived goal progress significantly increased from the low to the intermediate goal progress condition ($M_{\text{low}} = 1.68$ vs. $M_{\text{intermediate}} = 3.88; F(1, 286) = 66.46, p < .001$), and from the intermediate to the high goal progress condition ($M_{\text{intermediate}} = 3.88$ vs. $M_{\text{high}} = 5.78; F(1, 286) = 48.66, p < .001$); likewise, in the non-specific goal condition, perceived goal progress significantly increased from the low to the intermediate goal progress condition ($M_{\text{low}} = 1.75$ vs.

$M_{\text{intermediate}} = 3.30$; $F(1, 286) = 33.32, p < .001$), and from the intermediate to the high goal progress condition ($M_{\text{intermediate}} = 3.30$ vs. $M_{\text{high}} = 4.64$; $F(1, 286) = 23.98, p < .001$).

The 2 (goal specificity) x 3 (goal progress) ANOVA also revealed an interaction ($F(2, 286) = 4.95, p = .008$), simply reflecting a difference in the magnitude of the effect of the goal progress manipulation across goal specificity conditions. Most relevant to the present research, the pretest results demonstrate that the goal progress manipulation had the intended effect on goal progress perceptions in both goal specificity conditions.

Progress Pretest for Weight Loss Goals (Study 3)

Method. Pretest participants were recruited from Amazon Mechanical Turk in exchange for small payment ($N = 243$, average age = 34.00 years, 37.4% female). Participants were randomly assigned to one condition in the same 2 (goal specificity: specific, non-specific) x 2 (goal progress: low, high) between-subjects design used in Study 3.

To verify the effect of our progress manipulation, we measured goal progress perceptions using two measures: “At this point, how much progress would you feel you had made?” (1 = *A little*, 7 = *A lot*) and “At this point, how much weight would you feel you had lost so far?” (1 = *A little*, 7 = *A lot*). These items were highly correlated ($r = .84$) and combined.

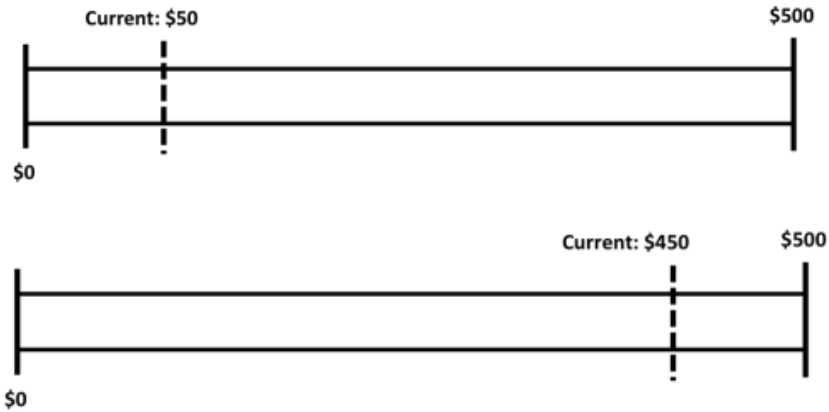
Results. A 2 (goal specificity) x 2 (goal progress) ANOVA on perceived goal progress revealed a main effect of goal specificity ($F(1, 239) = 24.15, p < .001$), such that overall, participants in the specific goal condition perceived greater goal progress than did those in the non-specific goal condition ($M_{\text{non-specific}} = 3.30$ vs. $M_{\text{specific}} = 4.11$).

Importantly, this analysis also revealed the expected main effect of goal progress ($F(1, 239) = 42.02, p < .001$). Confirming that the manipulation worked as intended, the progress manipulation increased perceived progress in both the specific goal ($M_{\text{low}} = 3.46$ vs. $M_{\text{high}} = 4.99$;

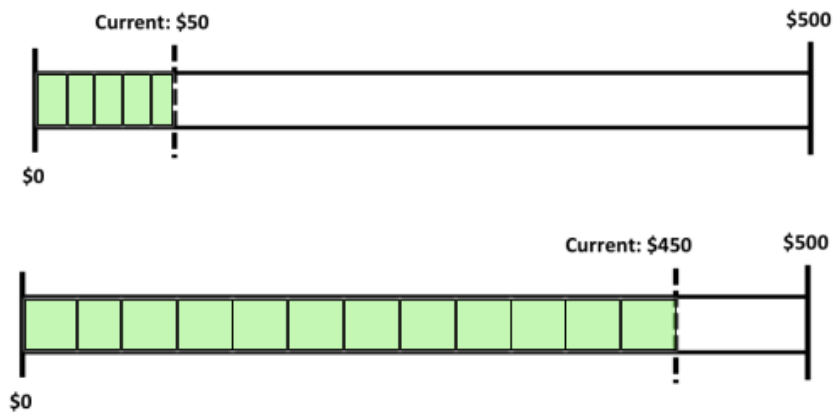
$F(1, 239) = 27.55, p < .001$) and the non-specific goal condition ($M_{\text{low}} = 2.65$ vs. $M_{\text{high}} = 3.79$;
 $F(1, 239) = 15.33, p < .001$). There was no interaction between goal specificity and goal progress
($F < 1$).

Appendix C. Essay 1 Reference Point Manipulation Stimuli (Study 4A)

Specific Control Condition:

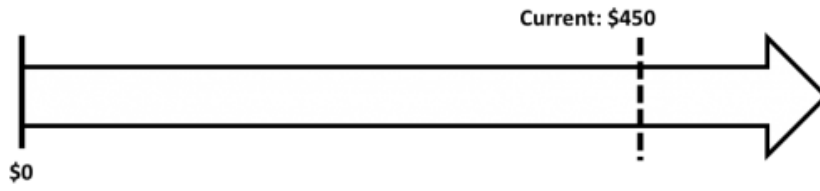
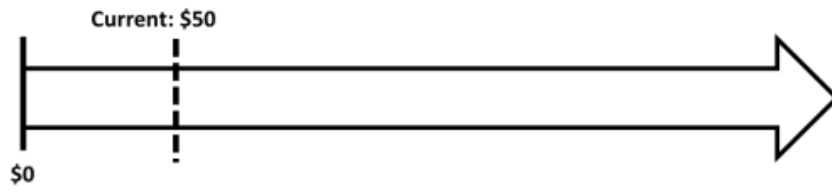


Specific Initial-State Focus Condition:



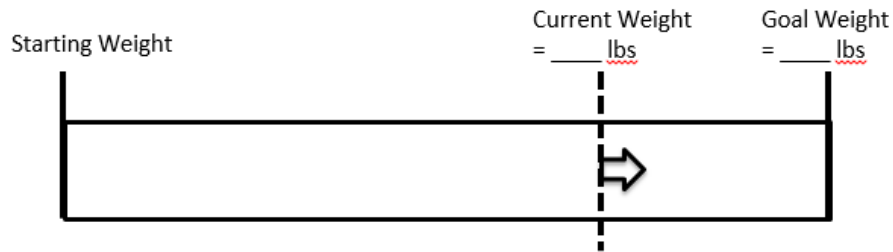
Note—Highlighted segments turned from white to green as participants selected them.

Nonspecific Condition:

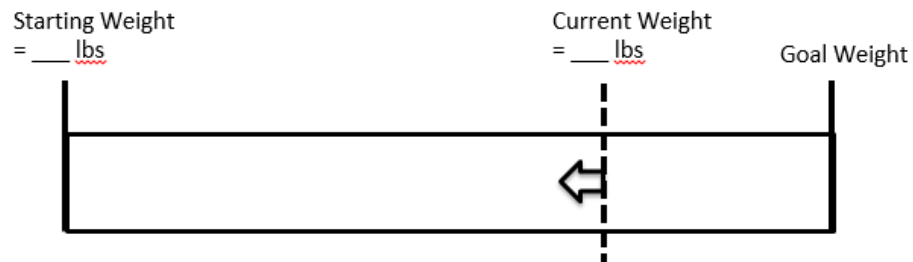


Appendix D. Essay 1 Reference Point Manipulation Stimuli (Study 4B)

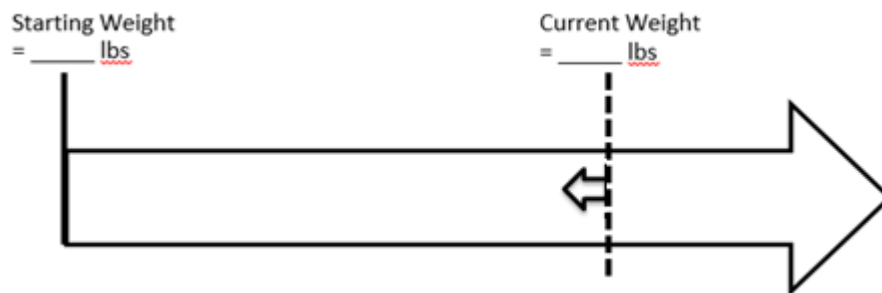
Specific End-State Focus Condition:



Specific Initial-State Focus Condition:



Non-Specific Condition:



Appendix E. Essay 2 Subjective Impact Results (Study 4)

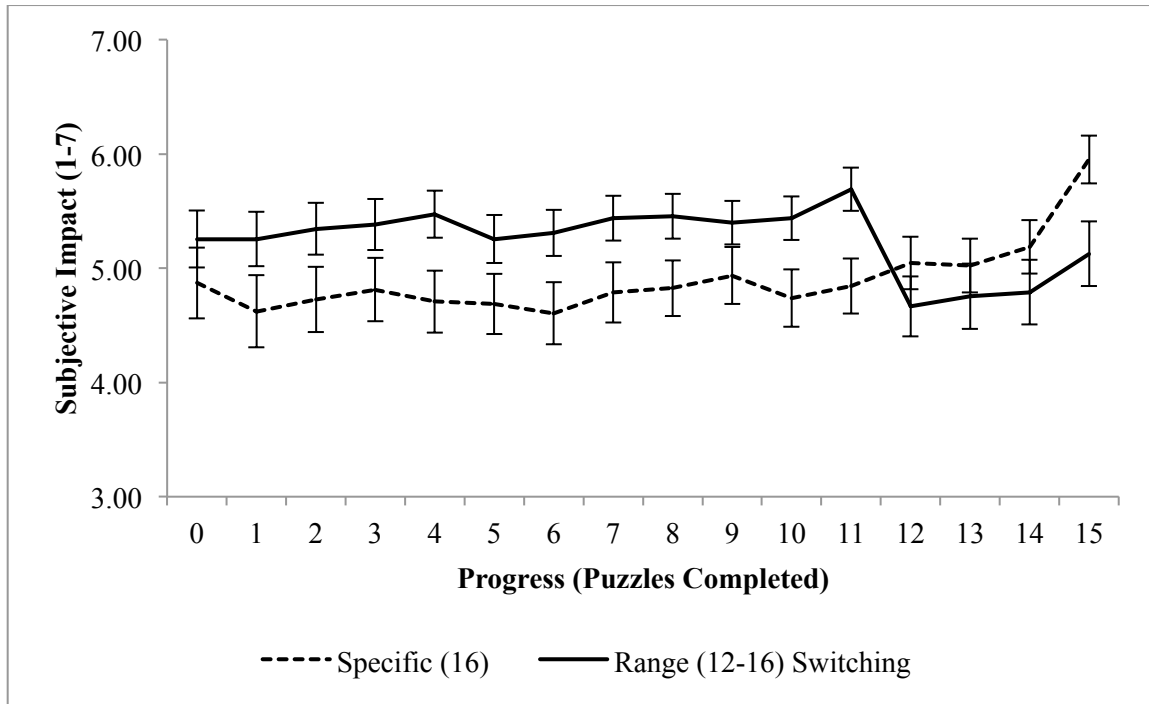


Figure 17. Subjective impact results for specific goal (16) and range goal switching (12-16) conditions.

Appendix F. Essay 3 Lunch Choices Stimuli (Study 3A)

Where applicable, differentiated text by condition is shown in brackets as follows:
[Just Below/Just Above/Way Above]

Introductory Text

On the following pages, you will be asked to make a **series of choices** about what you'd like to buy for lunch over the course of **five days**.

As you make these choices, imagine that you have a personal **budget of \$45** to buy lunch for these five days. You can afford to spend more than this if you need to, but to help manage your spending you have set a **budget of \$45**.

Day 1 Description and Choices

This is Day 1. You are buying lunch at a nearby restaurant and you're choosing between two options. (Assume prices include tax and tip)

Caprese Sandwich on Ciabatta, [\$7.50/\$8.50/\$10.00]

Fresh mozzarella, beefsteak tomato, and basil pesto on a housemade ciabatta roll. Served with a soft drink and your choice of side. (Vegetarian. Gluten-free substitutions available)

Turkey Club Sandwich, [\$9.00/\$10.00/\$11.50]

Smoked turkey breast, thinly sliced and served with bacon, lettuce, tomato, and mayonnaise on our freshly baked white, wheat, sourdough, or gluten-free bread. Served with a soft drink and your choice of side.

Day 2 Description and Choices

This is Day 2. You are buying lunch at a nearby restaurant with a fixed-price lunch buffet.

Lunch Buffet Special, [\$7.50*]

Our signature lunch buffet featuring more than twenty-five salads, entrees, and sides for you to choose from.

**Buffet price was adjusted based on Day 1 choices to bring each condition's total spending to [\$16.50/\$19.50/\$22.50], respectively.*

Day 3 Description and Choices

This is Day 3. You are buying lunch at a nearby restaurant and you're choosing between two options. (Assume prices include tax and tip)

Bosc Pear Salad with Chicken, [\$7.50/\$8.50/\$10.00]

Organic romaine lettuce with vine-ripened tomatoes, toasted almonds, bosc pear, and a flame-grilled chicken breast. Served with a soft drink, your choice of dressing, and one side. (Gluten-free. Vegetarian option available)

Mediterranean Wrap, [\$8.50/\$9.50/\$11.00]

Whole wheat wrap with kale and arugula blend, sun-dried tomatoes, diced cucumbers, and tzatziki sauce, with your choice of rotisserie chicken, beef, lamb, or tofu. Served with a soft drink and your choice of side. (Gluten-free and Vegetarian options available)

Day 4 Description and Choices

This is Day 4. You are buying lunch at a nearby restaurant where you can customize your order. (Assume prices include tax and tip)

All orders come with your choice of protein (chicken, beef, pork, or tofu), grain (white rice, brown rice, or quinoa), up to four toppings, and sauces.

Pita Wrap, [\$9.00*]

Your custom selections wrapped in your choice of white or whole wheat pita, served with your choice of soft drink.

Burrito Wrap, [\$9.00*]

Your custom selections wrapped in your choice of white or whole wheat flour tortilla or spinach wrap, served with your choice of soft drink.

Salad (Bowl), [\$9.00*]

Your custom selections served on a bed of freshly chopped romaine, kale, spinach, or arugula, served with your choice of soft drink.

** Meal prices were adjusted based on Day 3 choices to bring each condition's total spending to [\$33.00/\$38.00/\$44.00], respectively.*

Day 5 Description and Choices

This is Day 5, the last day. You have spent [**\$33.00/\$38.00/\$44.00**] **so far** out of your **budget of \$45.00**.

You are choosing between two new restaurants in the area that you've been wanting to try. You've looked at some online reviews for both and found the following:

Mr. Brooks' American Bistro, \$11.00 for lunch (average)

Classic, artisan-crafted American fare. Friendly and attentive service, great atmosphere, good for lunch. Average Rating: 4.5 stars.

Reveler's Roost, \$8.00 for lunch (average)

Trendy new lunch spot with an eclectic menu. Quick but friendly service, casual atmosphere, good for lunch. Average Rating: 3.5 stars.

If you spend \$11.00 on lunch at Mr. Brooks', your final spending will be [**\$44.00/\$49.00/\$55.00**].

If you spend \$8.00 on lunch at Reveler's Roost, your final spending will be [**\$41.00/\$46.00/\$52.00**].

Appendix G. Essay 3 Meal Choices Stimuli (Study 3B)

Introductory Text

In the Food Choices study, you will be asked to make a **series of choices** about what you'd like to eat for **several meals over the course of a fictional day**. As you make these choices, you'll be asked to imagine that you have a **personal goal** to limit yourself to **2000 calories** for the day. Assume this calorie budget is intended to help you avoid potential overeating and better manage your health and fitness.

Breakfast Description and Choices

You are buying breakfast at a casual restaurant with the following menu options.

Oatmeal

Organic oatmeal topped with fresh blueberries, strawberries, and blackberries.

Eggs and Toast

Two eggs made to order, served with white or whole wheat toast.

Avocado Toast

White or whole wheat toast, generously topped with avocado seasoned with freshly cracked red and black pepper and sea salt.

Fruit Smoothie

A mix of strawberries, blueberries, and bananas, blended with Greek yogurt and fresh juices squeezed in-house.

Please select your breakfast choice:

- *Oatmeal*
- *Eggs and toast*
- *Avocado toast*
- *Fruit smoothie*

Please select your beverage choice: Coffee, Tea, Orange juice, or No beverage (water only)

Lunch Description and Choices

For lunch, you go to another casual restaurant nearby with the following menu options.

Caprese Sandwich on Ciabatta

Fresh mozzarella, beefsteak tomato, and basil pesto on a housemade ciabatta roll. Served with a soft drink and your choice of side. (Vegetarian. Gluten-free substitutions available)

Turkey Club Sandwich

Smoked turkey breast, thinly sliced and served with bacon, lettuce, tomato, and mayonnaise on our freshly baked white, wheat, sourdough, or gluten-free bread. Served with a soft drink and your choice of side.

Caesar Salad

Fresh Romaine and our housemade Caesar dressing topped with croutons, shaved Parmesan cheese, and Campari tomato. Add grilled chicken breast for a small fee. Served with a soft drink. (Vegetarian. Gluten-free substitutions available).

Please select your lunch choice:

- *Caprese Sandwich on Ciabatta*
- *Turkey Club Sandwich*
- *Caesar Salad (no chicken)*
- *Caesar Salad (with chicken)*

Please select your beverage choice: Soda (Coke, Sprite, Dr Pepper), Diet Soda (Diet Coke), Iced Tea (Unsweetened), Iced Tea (Lemon, Raspberry), No beverage (water only)

Dinner Description and Choices

For dinner, you go to a slightly upscale restaurant with the following menu options.

Bosc Pear Salad with Chicken

Organic romaine lettuce with vine-ripened tomatoes, toasted almonds, bosc pear, and a flame-grilled chicken breast. Served with your choice of dressing and one side. (Gluten-free. Vegetarian option available)

Mediterranean Wrap

Whole wheat wrap with kale and arugula blend, sun-dried tomatoes, diced cucumbers,

and tzatziki sauce, with your choice of rotisserie chicken, beef, or tofu. Served with your choice of side. (Gluten-free and Vegetarian options available)

Woodfired Salmon

Wild-caught salmon expertly prepared on our woodfired grill, served with a light lemon garlic sauce on a bed of rice with your choice of side.

Please select your choice for dinner:

- *Bosc pear salad (with chicken)*
- *Bosc pear salad (no chicken)*
- *Mediterranean Wrap (with chicken)*
- *Mediterranean Wrap (with beef)*
- *Mediterranean Wrap (with tofu)*
- *Woodfired Salmon*

Please select your side choice:

- *Seasonal Vegetables*
- *Quinoa*
- *House Side Salad*
- *Roasted Fingerling Potatoes*

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Biography

Scott Gordon Wallace was born in Erie, Pennsylvania on January 17, 1989, and grew up in Pittsford, NY. He received his undergraduate education at the University of Virginia where he was an Echols Scholar and earned his B.S. in Commerce with a focus in Marketing from the McIntire School of Commerce in May 2011. Scott began his graduate career in August 2012 studying Consumer Behavior with the Marketing group at Duke University's Fuqua School of Business, where Scott was a James B. Duke Fellow and a member of the Society of Distinguished Fellows. In his time at Duke, Scott has published three refereed journal articles. One article is based on Essay 1 of this dissertation and is published in the *Journal of Consumer Research* ("How Goal Specificity Shapes Motivation: A Reference Points Perspective"). Scott's other two published articles appear in the *Annals of Thoracic Surgery* ("Patient Preferences in Treatment Choices for Early-Stage Lung Cancer") and in the *Journal of Hand Surgery* ("Conjoint Analysis of Treatment Preferences for Nondisplaced Scaphoid Fractures"). Upon leaving Duke, Scott will be joining the faculty of the University of Washington's Foster School of Business as an Assistant Professor of Marketing and International Business.