Overcoming Obstacles: The Adaptive Nature of Abstract Construals

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This dissertation titled
Overcoming Obstacles: The Adaptive Nature of Abstract Construals

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Abstract

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Research investigating the impact of mental construals on task performance suggests concrete representations as the mindset of choice when faced with a difficult task due to their anticipatory features. However, the current project claims that the consequences of mental construals on performance and motivation can only be fully understood when one considers the nature of the obstacles inherent in the difficult task. Three studies investigated the impact of obstacle manageability and mental construal on task performance and motivation. Specifically, Study 1 provided evidence that abstract construals could indeed be more advantageous than concrete construals when faced with a difficult task. Study 2 then targeted the manageability of the obstacles inherent in the difficult task, while Study 3 sought to uncover possible mechanisms that would help explain the differential effects of construals under varying degrees of obstacle manageability. The results revealed that abstract construals led to better task performance than concrete construals when the obstacles inherent in the task were deemed unmanageable. Possible cognitive and motivational influences are investigated and discussed.

Approved: _____________________________________________________________

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"Obstacles are those frightful things you see when you take your eyes off your goal."

– American industrialist Henry Ford

Introduction

The plan for quarterback Ben Roethlisberger after being drafted by the Pittsburgh Steelers in the 2004 NFL draft was to sit and learn from more veteran players for a year or two until he gained enough experience in the pro ranks to one day be the starting quarterback. In fact, Roethlisberger started his rookie season as the third string quarterback, and wasn’t expected to play much at all. However, a preseason injury to second string QB Charlie Batch, and then a Week 2 injury to starter Tommy Maddox suddenly pushed “Big Ben” into a precarious situation that he did not anticipate to have so early. In addition to the sudden pressure of having to lead his team in only his third week as a professional, certain obstacles were immediately made salient (especially by the media) that did not bode well for Roethlisberger’s immediate success. Historically, rookie quarterbacks did not fare well in the NFL. The playbook is too complicated to learn in only a few months, and the speed of the game is too fast for a player less than a year removed from college. A few of his teammates agreed as they publically questioned whether Roethlisberger was ready to be a starter in the NFL. To add more difficulty to the situation, his first game as a starter was played in a torrential downpour in front of hostile fans in Miami, and if that wasn’t enough, his first pass as a starter was an interception!
Considering the many obstacles, the Pittsburgh faithful were ready to flush the season down the drain. To their delight, however, Roethlisberger was able to overcome many of these obstacles and complete a record breaking rookie year. He finished the regular season with a 13-0 record and was unanimously selected as the NFL Offensive Rookie of the Year (the first quarterback in 34 years to be honored as such). In the midst of his historic rookie campaign, Roethlisberger was asked how he was able to overcome so many obstacles that have overwhelmed many before him. He simply replied, “I don’t worry about the things that I can’t control.” Roethlisberger’s comment encapsulates the mindset of other inspiring individuals who have overcome obstacles to such a great degree that the phrase has become somewhat of a cliché. Yet, despite the implication of perseverance no matter the odds, research in self-regulation and goal striving contends that goal de-commitment is a wiser course of action when feasibility decreases and costs increase (Carver & Scheier, 1990; Förster, Liberman, & Higgins, 2005; Oettingen & Kappes, 2009; Oettingen, Pak, & Schnetter, 2001; Williams and DeSteno, 2008). Nevertheless, the fascination with stories of similar success despite unmanageable obstacles is undeniable as they provide inspiration and motivation no matter the odds. Perhaps Thomas Edison captured this sentiment best when he remarked, “Many of life's failures are people who did not realize how close they were to success when they gave up.”

A component that makes these success stories so compelling is the ability to continue striving towards the ultimate goal despite inevitable and sometimes insurmountable barriers. Not only do these individuals or groups of individuals maintain
their motivation, but they also manage to succeed in the task once thought impossible. This implies a lack of concern for obstacles that cannot be managed. The phrase “paralysis of analysis” is used to describe the failure to continue towards a goal after an overemphasis on the obstacles. Similarly, the term “optimal ignorance,” used often in legal and financial settings, implies that the details of information required to succeed in a task should be kept to a minimum. This idea is by no means novel to the psychological world as “fast and frugal reasoning” research by Gigerenzer and colleagues (Gigerenzer & Goldstein, 1996; Goldstein & Gigerenzer, 2002) outlined instances when less knowledge was better.

President John Quincy Adams was once quoted as saying that “patience and perseverance have a magical effect before which difficulties disappear and obstacles vanish.” Through what effect exactly can difficulties and obstacles “vanish?” Specifically, what type of thought process compels one to persevere on a difficult task, face its inherent obstacles (especially some that are supposedly insurmountable), and ultimately succeed? Research on mental construals has investigated how one mentally represents a certain task, and how that representation affects consequent action. The present paper suggests that mental construals may have differential effects on goal persistence depending on the obstacles inherent in the task. This paper will first review research on mental construals and its related literature, revealing that concrete construals are the preferred mode of thought when dealing with difficult tasks. An attempt will then be made to show that there are indeed situations of difficulty when abstract construals will be better served. In particular, when obstacles inherent in the difficult task are
unmanageable, abstract thought will prove beneficial in maintaining persistence towards the goal by turning the focus away from such divisive information, whereas concrete construals achieve the opposite by making the complexity of the task more salient.

**Construal Theory**

Essentially, any action can be construed at differing levels of abstraction. For example, the act of “going on a date” could be represented as “getting to know someone,” “exchanging small talk,” “making a good impression,” “seeking a mate,” or simply as “eating food with another.” In order to establish a link between these sorts of mental representations and overt behavior, Vallacher and Wegner (1987) proposed their theory of action identification which suggests that actions can be classified into a hierarchy of two levels: low-level identities that convey the details of an action, and high-level identities that convey the general representation of the action. In particular, low-level identities communicate the specifics of an action and thus indicate *how* an action is carried out, whereas high-level identities tend to be more comprehensive and indicate *why* an action is carried out. Therefore, “getting to work on time” represents the act of “driving” at a high-level of identification, while “turning the key” represents the act at a lower level of identification.

Likewise, Trope and Liberman (2003) proposed their construal level theory (CLT) which also suggests that any event or object can be represented with either high-level construals which involve abstract conceptualizations about objects or events, or low-level construals which involve concrete conceptualizations about objects or events. Specifically, abstract construals capture the superordinate, decontextualized, and goal
relevant features that convey the general meaning of an event, whereas concrete construals consist of subordinate, contextualized, and goal irrelevant features that convey the specifics of an event (Liberman, Sagristano, & Trope, 2002). Importantly, an individual’s judgments and behaviors are a function of construal level, such that construing an event abstractly leads to decisions and actions that consider more primary features, whereas construing an event concretely leads to decisions and actions weighted towards more secondary features.

The difference between CLT and action identification theory are the dimensions to which each apply. Action identification theory is intended to specify what people think they are doing (i.e., how they identify actions - at high or low-levels) and the contextual cues that determine when each level will be enacted (e.g., individuals are sensitive to higher levels of identification until the novelty of the situation necessitates a move to lower level identifications). CLT, on the other hand, has broader implications as it applies to any event or object, not just as an account of the means and the ends. For instance, an individual in the market for a new car can focus abstractly on the more primary features of the car (e.g., safety ratings) or concretely on the specific, secondary features (e.g., color) without actual means-ends implications.

One factor important in CLT is psychological distance of the target in consideration. Increasing distance from a target on any psychological dimension (i.e., time, space, social distance) augments activation of high-level construals and decreases activation at low-levels (Liberman et al., 2002; Trope & Liberman, 2003). In an experiment by Liberman and Trope (1998), participants were asked to imagine and
describe themselves engaging in a variety of activities (e.g., reading a book, taking an exam) either tomorrow or next year. Results showed that high-level, abstract descriptions were more likely when the event was imagined in the distant future as opposed to the near future, whereas descriptions were more concrete when the event was imagined in the near future as opposed to the distant future. Analysis of content revealed that high-level descriptions were structured as “[description] by [activity],” while low-level descriptions were structured as “[activity] by [description]” (Hampson, John, & Goldberg, 1986). For instance, describing the activity of “reading a book” as “broadening my horizons” fits the high-level structure as “I [broaden my horizons] by [reading a book],” thereby representing the event in abstract, more generalized terms characteristic of distant-future construals. In contrast, describing the same activity as “turning pages” fits the low-level structure as “I [read a book] by [turning pages],” thereby representing the event in concrete, more specific terms characteristic of near-future construals (Trope & Liberman, 2003).

Construal theory holds important implications on behavior which are especially relevant to the current paper. In particular, CLT supposes that self-regulatory behavior is more likely to be guided by high-level construals rather than low-level construals. The abstract quality of attitudes and social values serve as better predictors of behavior for distant-future events more so than near-future events. Therefore, core values may be the primary guides for behavior in the distant future, whereas secondary specifics of a particular situation are more likely to guide behavior in the near future (Schwartz & Bilsky, 1987; Trope & Liberman, 2003). For example, an abstract construal like “stay
healthy” may lead to a decision to run a marathon in the distant future, but the decision to run a marathon in the near future is more likely to reflect factors made salient by concrete construals, such as the weather or date of the marathon.

There is a litany of literature that we can consider for further insight on how construal level affects behavior and how it relates to goal-commitment and even performance. In particular, concepts within self-regulation and goal setting provide a theoretical foundation for the objectives the current project wishes to achieve.

Related Approaches

Control theory

Control theory has roots in mathematics and engineering, and supposes a dynamic system of feedback control that works to bring a system’s actual state and reference value in line. In psychology, control theory proposes that self-regulation works as a process of feedback control in which individuals monitor and compare their current state with their desired state (e.g., goals) and adjust behavior accordingly in order to better approximate the reference value (Carver & Scheier, 1982, 1990, 1998).

An important principle of control theory – and a logical compliment to construal theory – is the organization of the feedback loop into a hierarchy of abstract levels of control down to more concrete levels of control (Carver & Scheier, 1990; Powers, 1973). Feedback includes the identity of one level being influenced by the resetting of standards at the next lower level. System concepts define the highest level of abstraction and represent the idealized self. Reference values at this level are the most abstract and difficult to define. The output of the system concepts level provides the reference values
for the next lower level of *principle*, which begins to define some sort of behavior (e.g., be kind). Representations become more concrete as principle output continues to be fed down into the *program* level, which is essentially one’s actual behavior (e.g., open the door for someone).

Inherent in control theory is that representations which are too abstract can become disadvantageous under circumstances of difficulty, novelty, or stress, such that the reference values that require order throughout the hierarchy can break down control and lead to poor self-regulation. For example, adopting an abstract level of control for the goal “play mistake free” would not be beneficial for the novice piano player being evaluated at a recital. In this case, there is not enough specification in the high-level reference values to translate into concrete behavior. Instead, control of the behavior should be located at the lower, more concrete levels in the hierarchy that are concerned with specific behaviors.

Furthermore, control at an abstract level may interfere with goal disengagement that is crucial to proper self-regulation. The higher, more abstract the representation of the goal is in the hierarchy, the more important the goal becomes to the general sense of self, and the longer one would unconstructively stay committed to an impossible goal (McIntosh & Martin, 1992). In this case, the individual is trapped in a situation where he or she can neither make progress toward the goal nor abandon it, which may even lead to unhelpful rumination (Watkins, 2008).
Goal striving and mental simulation

Self-regulation approaches such as control theory focus on how to increase commitment and striving towards a goal via a discrepancy-reducing loop that compares an input value to a set standard. In contrast, research on mental simulation suggests a self-regulatory strategy of contrasting a desired future with the reality that impedes its fulfillment (Markman & McMullen, 2003; Markman, Ratcliff, Mizoguchi, Elizaga, & McMullen, 2007; Oettingen, 1999; Oettingen et al., 2001). Specifically, an individual first imagines the attainment of a desired future (e.g., earning a doctorate) and then reflects on the present reality that stands in the way of attaining that future (e.g., dissertation defense, time constraints). Contrasting the future and reality makes salient the obstacles within the present reality that prevent the realization of the desired future. Depending on the assessment, expectations are developed that guide the individual to stay committed to the goal or to cut losses and disengage from the goal (Oettingen & Kappes, 2009).

Inherent to this theory of mental contrasting is that abstract representations are involved in future thinking (i.e., superordinate goals), and concrete representations are involved in reality thinking (i.e., subordinate goals). As such, goal-directed actions may be construed in terms of relatively abstract “why” aspects of an action or as more specific “how” details of the action (Vallacher & Wegner, 1987). High-level construals are therefore likely to represent actions in terms of the future goal, whereas low-level construals represent actions in terms of present reality. In line with research on mental construals, the optimal goal-directed strategy is to develop a plan and to anticipate the

**Advantages of Concrete Construals**

**Process versus outcome-simulation**

As the self-regulation and goal setting literature implies, concrete construals, in contrast to abstract construals, lead to more constructive consequences when faced with a certain task. For instance, concrete construals produce improved self-regulation compared to abstract construals. When faced with a task or event (especially one that is stressful), mentally simulating the detailed process of completing the goal, especially anticipating potential obstacles inherent in a stressful situation, produced progress in achieving the goal, whereas generally envisioning successful completion of the goal did not (Taylor, Pham, Rivkin, & Armor, 1998). According to this process-simulation viewpoint, by representing a task at a lower construal level, the individual mentally simulates the actual steps required in completing the goal while at the same time anticipating potential obstacles which allows for any necessary adjustment. The individual, therefore, can prepare a plan with contingencies that increases the likelihood that the goal will be attained. For example, the individual who desires to lose weight increases his or her chance of doing so by mentally representing the task in detailed, step-by-step fashion, such as joining a gym, running on the treadmill, outlining a diet, and so on. The process-simulation approach is similar to Gollwitzer’s (1999) implementation
intentions approach which specifies the responses that lead to goal attainment. In essence, simulating the process provides the structure “When x arises, I will perform response y.” Thus, once a goal is set, it is made more feasible by concretely outlining specific intentions that one plans to implement upon experiencing a certain situation.

This approach is in contrast to the outcome-simulation viewpoint characteristic of self-help literature (e.g., Fanning, 1994), which suggests that representing the task at a high construal level and simply focusing on the desired outcome, as opposed to simulating the process, would help bring it about. Self-help and positive attitude writers such as Norman Peale (1982) suggest that one needs to merely envision success and visualize completion of the goal in order to achieve one’s aspiration. Granted, an advantage to the outcome-simulation viewpoint is the emotional regulation one might gain from such a high-level representation. For example, focusing on a skinnier version of oneself or how one’s clothes may fit better may provide motivation to stay committed to the goal of losing weight. Nevertheless, research has shown that process-simulation is superior to outcome-simulation in both problem solving/planning and emotional regulation (Pham & Taylor, 1999; Taylor et al., 1998). Therefore, concrete construals help prepare an individual in achieving a goal by providing a step-by-step plan of attack and developing contingencies for potential obstacles while maintaining motivation by regulating emotion.

_Mitigates debilitating effects of excessive self-focus_

Individuals sometimes fail to reach optimum levels of performance because of excessive self-focus. In essence, they are unable to exert sufficient control over their
actions because they are focusing too much on themselves and essentially trying too hard. The debilitating effects of excessive self-focus have in fact been theorized to contribute to choking under pressure and test anxiety (Baumeister & Showers, 1986; Beilock & Carr, 2001). Furthermore, trying to control the negative focus on the self can make the unwanted thoughts more cognitively available (Wegner, 1989) leading to lower state self-esteem, greater anxiety, and depressed mood (Borton, Markowitz, & Dieterich, 2005). Thoughts of the self that especially interfere with the ability to regulate often focus on the meaning or consequence of behavior while simultaneously distracting from focusing on the behavior itself. Take for instance, the student who wishes to perform well on the midterm, but instead converges excessively on self-relevant thoughts, like how a failing grade would result in a loss of scholarship, increasing the chances for calamitous results.

The abstract nature of self-relevant thoughts does not facilitate performance, so one must instead focus attention on the concrete aspects of the task at hand (Leary, Adams, & Tate, 2006). Doing so (a) helps focus attention on the demands of the present situation (e.g., the student takes the test one question at a time rather than focusing on the consequences of a bad grade), (b) reduces anxiety, and (c) requires less effort, thus freeing up self-regulatory resources (e.g., the less distracted one is by the prospect of losing a scholarship, the more focused he or she can be on each question). Therefore, in contrast to abstract, self-focused construals, the use of concrete construals is more adaptive in that it frees up cognitive resources and reduces anxiety, especially when the task is considered difficult (Vallacher & Wegner, 1987; Vallacher et al., 1989).


Increased preparation

Another important advantage to concrete thought concerns the implications it has on preparation for future tasks. Temporal construal theory (Trope & Liberman, 2003) suggests that tasks perceived as being in the temporally distant future are construed in more abstract terms with a focus on the desirability of goals, whereas tasks perceived as being in the temporally close future are construed in more concrete terms with a focus on the feasibility of goals (Sagristano, Trope, & Liberman, 2002). This perspective is especially beneficial to defensive pessimists – individuals who adopt a negative future outlook as a strategy of self-protection by bracing for potential loss or failure, and motivation to increase preparation for the eventual possibility of doing well (Sanna, 2000; Showers & Ruben, 1990). In essence, thinking about the potential bad outcomes helps defensive pessimists prepare to prevent those outcomes from materializing (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996). For example, defensive pessimists performed better on an arithmetic task (Norem & Illingworth, 1993) and on a dart-throwing task (Spencer & Norem, 1996) when they first thought through all possible negative outcomes.

As it relates to construal theory, defensive pessimists may use the temporal proximity of negative futures as motivation to perform well and protect themselves from possible failures. Sanna, Chang, Carter, and Small (2006) manipulated temporal distance and examined if defensive pessimists would perform well on an anagram task when future failure was close. Participants in the close condition were instructed to “think about the future anagram performance, which is only a short time away,” whereas
participants in the far condition were asked to think about their anagram performance, “which is still a long time away.” As predicted, defensive pessimists, in contrast to optimists, performed well when negative futures were close (Sanna et al., 2006). Further, Sanna and colleagues suggested that defensive pessimists’ strategy involved construing the future concretely in terms of feasibility and planning, in contrast to optimists who construed the future abstractly in terms of desirability. Thus, viewing tasks of close temporal proximity in more concrete terms was advantageous for defensive pessimists because it allowed them to anticipate all potential obstacles for a future task and increased preparation for them accordingly.

Better problem solving

Remember that construal theory has foundations in Vallacher and Wegner’s (1987) influential action identification theory which established that action identifications (i.e., construals) could be classified into low-level identities that convey the details of an action or high-level identities that convey the general representation of the action. A principle of action identification states the tendency for higher level identities to become prepotent when representing an action or event. However, when an action cannot be maintained in terms of its high-level identity due to difficulty of the action, then there is a tendency for a lower level identity to be become prepotent (Vallacher & Wegner, 1987). For example, when made to drink coffee out of a normal cup (i.e., an easy task), participants naturally endorsed higher level identities (e.g., “getting energized,” “promoting my caffeine habit”) because concrete details of drinking coffee from a cup were not necessary to represent the action. Conversely, when asked to drink coffee out of
an awkward cup (i.e., difficult task), the higher identity could no longer be maintained
and participants instead endorsed more concrete, lower level identities (e.g., “drinking a
liquid,” “lifting cup to my lips,” “swallowing”).

Watkins and Baracaia (2002) also associated low-level construals with better
problem solving. In particular, they investigated the ameliorating effects of concrete
construals on problem solving among depressed individuals. A consequence of
depression is a state-orientation of thinking that is characterized by the preoccupation
with past successes and failures, which in turn produces difficulties in initiating new
actions required for problem solving (Kuhl, 1981). They hypothesized that inducing a
more concrete, process-oriented mindset improved problem solving among depressed
individuals. While asked to provide answers for the Means-Ends Problem Solving test
(MEPS; Marx, Williams, & Claridge, 1992), participants were asked to keep in mind
either state-oriented questions (e.g., “What is the reason behind all this?” “What caused
the problem?”) or process-oriented questions (e.g., “How am I deciding what to do next?”
“How do I decide whether my plan needs to be changed?”). As predicted, the concrete
nature of process-focused questions significantly improved problem solving among
depressed patients compared to no questions or state-oriented questions (Watkins &
Baracaia, 2002).

Less worry

Concrete construals also have positive implications on the experiences of worry
and anxiety. When a threat (e.g., a difficult task) is detected, worry is initiated and is
followed by negative thoughts and images that serve as a type of cognitive avoidance
response (Borkovec, Ray, & Stober, 1998; Tallis & Eysenck, 1994). In turn, negative thoughts lead to a search for a solution, and only after selection and implementation of the solution occurs will the threat and accompanying worry expire. Abstract construals, on the other hand, reduce the chances of finding concrete solutions, thus preserving the threat and maintaining the worry (Tallis & Eysenck, 1994).

Further analysis determined that worry is predominantly experienced as verbal thought rather than as images, because verbal thought yields less cardiovascular response from fear than imagery of the same stimuli (Vrana, Cuthbert, & Lang, 1986). Moreover, representations about problems that people worry about have been found to be more abstract and less concrete than problems that don’t elicit worry (Stober & Borkovec, 2002). The reduced-concreteness theory of worry (Stober, 1998, 2000) combines these concepts and proposes that worry is accompanied by a decrease in concrete imagery and is mostly experienced as words and sentences of reduced concreteness, which leads to negative consequences for problem solving and affect regulation. Evidence for the benefits of concrete construals on worry was found in clinical experiments with patients who suffered from generalized anxiety disorder (GAD). Specifically, untreated GAD individuals provided more abstract descriptions of their major worries relative to controls. After successful therapy, however, GAD individuals showed an increase in concreteness in their representations of their worries similar to control subjects (Stober & Borkovec, 2002). Therefore, concrete construals of worrisome thoughts play a role in the reduction of worry. Otherwise, worry with no indication of solution can have obvious adverse effects on behavior.
Reduced negative overgeneralizations

Concrete thought not only reduces worry, but also reduces negative overgeneralizations often associated with depression. Due to their superordinate and decontextualized nature, abstract construals could facilitate negative overgeneralizations of inadequacy that are characteristic of learned helplessness – a state of pessimism that is in part due to global personal attributions (e.g., “I am worthless”) as opposed to more situation specific attributions (Abramson, Seligman, & Teasdale, 1978; Peterson, 1999; Seligman, 1975). Abstract construals promote beliefs that an event is caused by factors that apply to a large number of situations (e.g., your intelligence), thus leading to negative overgeneralizations especially when faced with a difficult or stressful event. It is suggested, however, that concrete construals are more adaptive because the contextual and detailed nature facilitates the interpretation of negative events as unstable and situation specific (Seligman & Schulman, 1986; Showers, 1988). For example, the student who approaches an upcoming difficult exam concretely is more likely able to base his performance mostly on the amount of time spent studying and not his intelligence per se (i.e., unstable attribution) and as relevant only to this particular class and not others (i.e., specific attribution).

Similarly, Raes, Hermans, Williams, and Eelen (2006) investigated the effect of specificity of autobiographical memory on affective reactions. They discovered that participants who retrieved memories in a specific, contextualized way experienced less distress following a negative event compared to those who were induced to retrieve memories in an overgeneralized way. In line with affect regulation theory (Williams,
1996), the avoidance of specific memories following a negative event via abstract, decontextualized thought serves as a type of short-term suppression. However, the effect of suppressing unwanted thought eventually results in the emergence of what is suppressed (Wegner, 1989; Wegner & Wenzlaff, 1996) and thus backfires as a method of affect regulation. Thus, there is short-term benefit to putting off distracting thoughts by way of abstract construals. However, in the long run concrete thought is best in order to avoid negative overgeneralizations and depressive ruminations (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Wenzlaff & Luxton, 2003).

Summary

The benefits of concrete over abstract mental representations are well documented. Focusing on the process of achieving a goal leads to more constructive consequences than focusing on the outcome. Performance on a task is further enhanced via concrete construals by reducing excessive self-focus that could occupy cognitive resources required for success. Research investigating defensive pessimism has shown that concrete thought also has benefits in problem solving as it leads to increased preparation and better problem solving strategies by detailing the steps required for adequate solution, whereas abstract thought does not allow for such specific considerations. Moreover, concrete thought reduces worry because it is “situationally specific, clear and singular”, whereas abstract thought is “cross-situational, unclear, and aggregated” (Stober & Borkovec, 2002, p. 92). Further, negative overgeneralizations which can lead to learned helplessness and depression are reduced by concrete thought.
In sum, concrete construals help in our ability to self-regulate effectively. It’s when we think about the implications of our behavior we find it difficult to be successful.

**Advantages of Abstract Construals**

Abstract construals are not without their advantages as well. For instance, abstract thought maintains goal commitment and stabilizes behavior toward long-term goals by ensuring a focus on superordinate goals and minimizing interference from incidental demands. High-level construals lend to constancy because it shields the person against alternative thoughts that could ultimately change the nature of the action (Vallacher & Wegner, 1987, 1989). Therefore, individuals who sustain abstract thought can maintain their course of action even in the face of changing conditions or the passage of time. For instance, by construing the action at a high-level, the swimmer who sets “getting exercise” as a long term goal can persist in this goal regardless of other possibilities that might become available. Thus, whether jogging or riding a bike, he or she is still striving towards the higher level goal of getting exercise. Concrete construals, on the other hand, do not lend to such action flexibility and therefore allow for less variability in the mode of enactment (Vallacher & Wegner, 1987). Construing the goal of “getting exercise” at a concrete level for a swimmer may specify the more physical acts required for swimming (e.g., kick legs, stroke through water, breath in turn) and in turn does not lend itself to goal commitment in the face of interference (e.g., the pool is closed for cleaning).

Furthermore, abstract construals have been shown to produce greater self-control compared to concrete construals (Fujita, Trope, & Liberman, 2006; Fujita, Trope,
Liberman, & Levin-Sagi, 2006). This was especially relevant given prior research that suggested that self-control required one to consciously inhibit automatic behaviors (Heatherton & Baumeister, 1996; Muraven & Baumeister, 2000) or to make decisions in accordance with a focus on long-term rather than short-term outcomes (Trope & Fishbach, 2000). In a series of experiments, Fujita and colleagues manipulated construal levels and assessed the effects on self-control. Abstract or concrete construals were experimentally induced by having participants consider “why” versus “how” they engaged in a particular action. Of course, asking why one engages in an action activates high-level construals, whereas asking how one engages in an action activates low-level construals (Vallacher & Wegner, 1987).

In one study, level of construal moderated decision making through a reduced tendency to value immediate over delayed outcomes, suggesting that those induced with abstract construals demonstrated greater self-control than those induced with concrete construals (Fujita et al., 2006, Experiment 1). A second study showed a behavioral replication of their first experiment in that participants primed with abstract thought displayed greater physical endurance (i.e., holding a handgrip longer in order to receive more accurate personality feedback) than those primed with concrete thought (Fujita et al, 2006, Experiment 2). Throughout their studies, abstract construals consistently proved more beneficial in terms of greater self-control than concrete construals. They argued that the activation of abstract construals caused superordinate, high-level features of a situation to be weighed preferentially when making evaluations and decisions, thus
leading to greater self-control when the individual’s focus is on the primary objective and not secondary, incidental factors (Fujita et al., 2006; Trope & Liberman, 2003).

In addition, abstract construals allow for alternative subgoals when faced with goal discrepant information (Brunstein & Gollwitzer, 1996). According to Wicklund and Gollwitzer (1982), commitments to self-defining goals (e.g., becoming a competent physician) elicit continual striving to attain the high-level identity. When faced with information or a situation that is in opposition to their aspired-to identity, individuals a) choose to describe their personalities as being more consistent with the aspired-to, more abstract ideal (Gollwitzer & Wicklund, 1985; Wicklund & Gollwitzer, 1983), and b) perform better on a task if it provides an alternative indicator of their high-level identity.

Likewise, the compensation hypothesis (Brunstein & Gollwitzer, 1996) proposes that individuals who experience failure in a self-defining task will intensify their efforts on a subsequent subgoal described as being an alternative task at achieving their self-definition. In their study, medical students who were exposed to negative feedback concerning their competence as a physician performed better on a subsequent task when it was introduced as an alternate means of assessing their medical aptitude as compared to a control group. Further, after being exposed to the negative feedback, students who were given the opportunity for alternate subgoals reported a higher level of motivational involvement in the test. Representing goals at an abstract level allowed flexibility for alternate subgoals to satisfy the prepotent goal. Concrete construals, however, do not allow such flexibility. If the immediate goal of “write a song” is blocked, then the
prevailing construal of “be creative” provides alternative means to resolve the discrepancy (e.g., paint).

Finally, behavioral control can be construed at too low a level, such that easy or familiar actions can be disrupted when the concrete aspects are made salient. To the extent that behavior can be executed automatically, deliberate attempts to control it may often undermine performance (Vallacher & Wegner, 1987; Wegner, 1989). Impaired performance may especially result when trying to attend to already well-learned skills by consciously regulating the components of a behavior into separate and independent actions that ultimately sabotages the automaticity and smoothness of the once single, automatized sequence (Lewis & Linder, 1997). Thus, for the expert golfer trying to hit a drive, focusing concretely on the already well-learned details such as keeping the head down, bending the knees, breaking the wrist at the top of the backswing can introduce awkwardness in their stroke and inhibit optimal performance. Generally, individuals will seek out more abstract construals only when their skill and expertise readies them for the challenges of higher level thought, and when action becomes relatively easy to maintain the individual thus becomes sensitive to thoughts that would impart a higher level understanding (Vallacher & Wegner, 1987). For the expert golfer, then, her play would be better served with more abstract thoughts such as “demonstrate skill” or “intimidate opponent.”
Overview of Present Research

When behaviors are straightforward and practiced, abstract construals are effective as they help maintain focus on the superordinate goal. However, when the task is difficult, concrete construals are the representation of choice. “The more difficult or disruption-prone an action is under a given identity, the greater the likelihood that it will be enacted under a lower level” (Vallacher & Wegner, 1987, p. 7). As part of their attempt to outline the optimal level of mental representation given the situation, Vallacher and Wegner (1987) suggested that construal level depends on aspects of the situation called maintenance indicators, as they indicate the level at which action should be identified for optimal performance. One such maintenance indicator, and critical to the present project, is task difficulty. When the task presented proves difficult, individuals must concern themselves with the how-to aspects of the action which only concrete construals provide. For instance, participants in an experiment were asked simply to “eat Cheetos.” Some participants were to eat the Cheetos in the usual manner (i.e., with their hands), while other participants were asked to eat under more difficult circumstances (i.e., with chopsticks). Afterwards, when asked to represent the task, those in the non-chopsticks condition identified abstract representations such as “eating” and “reducing hunger,” while those in the more difficult chopsticks condition endorsed more concrete construals such as “chewing,” “swallowing,” and “moving my hands.” So although there is a constant press for higher level understanding, difficulty of the situation necessitated a move to more concrete thought (Vallacher & Wegner, 1987;
Wegner & Vallacher, 1987). A similar effect was obtained by Wegner et al. (1998, Experiment 2) in a study that involved drinking from an awkward coffee cup.

Concerning task difficulty and goal persistence, then, research suggests that people are more likely to commit to goals high in feasibility – expectations that future events will occur as a result of certain actions (Gollwitzer, 1990; Locke & Latham, 1990). Oettingen and colleagues (Oettingen, 1999; Oettingen & Kappes, 2009; Oettingen et al., 2001) proposed the model of fantasy realization to describe how self-regulation leads to goal commitment via mentally contrasting a desired future with the reality of obstacles that impedes its completion. In line with temporal construal theory (Trope & Liberman, 2003), inherent in the desired future are abstract representations, while inherent in the difficulties of reality are concrete construals. Mental contrasting makes accessible both the concrete reality and the abstract future, and frames reality as an obstacle in the way of the desired future. This connection elicits a necessity to act that in turn activates expectations which can determine the individual’s commitment to the goal, such that when expectations are high (i.e., the obstacles of reality are apparent, but can be addressed) then people will actively commit and continue to strive for the goal. By making the obstacles salient (i.e., concretely), the individual can make if-then plans to overcome them (Armor & Taylor, 1998; Gollwitzer, 1999; Oettingen et al., 2001; Oettingen, 2000). However, when expectations are low (i.e., the obstacles seem insurmountable) then goal commitment will decrease and people will likely refrain from goal striving (Oettingen & Kappes, 2009; Oettingen, et al., 2001).
Despite the prevalent research that identifies concrete construals as most adaptive in difficult situations, there is a failure in the literature to completely address the nuances of task difficulty. Specifically, the notion of obstacle manageability requires further investigation. When difficulty is an issue, most of the literature assumes obstacles that are surmountable or manageable. In other words, regardless of the difficulty of the task, goal commitment and eventual success is within reach if one were to construe the task in concrete, detailed terms in order to make salient and thus plan for all likely obstacles. The manageability of the obstacles, however, is an important assumption that lends to the benefits of concrete construals. A study conducted by Oettingen et al. (2001) typifies such a task labeled as difficult, but with obstacles that are nevertheless manageable. In their investigation of the effects of mentally contrasting the abstract-like desired future with the concrete-like reality on persistence and performance, participants were asked to anticipate any obstacles they would face in the admittedly difficult goal of succeeding in their mathematics requirements. Participants who contrasted their desired future with the present reality exhibited strong effort and better performance on a subsequent math test. Thus, as the literature documents, concrete construals proved adaptive in dealing with a difficult task and its obstacles.

Upon further investigation, however, the obstacles listed by students were all manageable in nature. The perceived obstacles offered by participants included “being lazy,” “being absent-minded,” and “being distracted by other students.” Although regarded as impediments to their goal, these obstacles were all manageable. Working harder counts laziness. More concentration cures the absent-minded. Focus on the task
helps alleviate distraction. Likewise, Cheetos can be eaten with chopsticks and coffee can be sipped from an awkward mug with effort and persistence. All obstacles were surmountable, anticipated, and then resolved.

This, however, does not explain occasions where certain obstacles inherent to the situation are insurmountable or unmanageable. Nor does it explain the many stories of persistence and success despite impossible odds. If concrete thought is the mental representation of choice, then why do idioms such as “keep your eyes on the prize” continue to serve as inspiration to think about the why of the goal and not the how? Perhaps, then, there are benefits to thinking abstractly during difficult situations.

Obstacle Manageability

Obstacle manageability is defined within this project as the degree to which an impediment inherent in a difficult task is capable of being managed or a solution can be engineered. Conversely, it is the extent to which an obstacle can be dealt with in order to achieve the goal it is related to. Although the term overlaps conceptually with synonymous terminologies popular in psychological literature such as “controllability” or “feasibility,” the term manageability best encompasses the crux that this paper is trying to articulate.

For instance, controllability was offered by Ajzen (1988, 1991) as a determinant of intent in his theory of planned behavior. Specifically, the likelihood of successful behavioral performance will vary as a function of the perceived controllability toward performing a behavior (Armitage, Conner, Loach, & Willetts, 1999). An action may be perceived as being within one’s behavioral control based on factors either internal or external to the person. Internal controllability is when an individual perceives that he or
she has control over personal resources (i.e., necessary skills) to perform the behavior (Armitage et al., 1999). The construct of manageability, however, is simply meant to represent the features of the obstacle, and not necessarily the skills of the individual. In fact, manageability assumes that the individual does indeed possess the resources necessary to attain the goal. It is emphasized here that the benefits of abstract construals are apparent when the task is difficult, yet attainable. The important distinction, then, is that a certain obstacle may be insurmountable, but the task itself is very much attainable via other routes.

The concept of external control is akin to the present notion of manageability. A behavior is said to have external controllability when it is perceived as free of external influences that can act as a barrier toward performing the behavior (Kidwell & Jewell, 2003). This is similar to the idea of facilitating conditions (Triandis, 1977) which suggests that a person is more likely to execute a behavior when it is perceived as being easy to perform. Again, the operationalization of manageability variable is meant not to describe behavior, but instead to describe the features of obstacles inherent in difficult tasks. Further, the term controllability suggests manipulation of a variable (e.g., “mind control,” “remote control,” “control theory”), which is not what the manageability variable intends. Instead, manageability implies the extent to which a variable can be overcome, not manipulated. For instance, a runner does not control a hurdle (i.e., one cannot manipulate the hurdle by somehow making it shrink), but instead manages over it.

Feasibility is another term used in related research that shares a likeness with our manageability variable. Liberman and Trope (1998) defined feasibility as the ease or
difficulty of reaching an end state. They contrasted feasibility with the notion of desirability, which refers to the valence of an action’s end state. Within their temporal construal theory, feasibility is described as representing subordinate, low-level construals that represent the “how” of an action. In addition, Bagozzi, Dholakia, and Basuroy (2003) describe feasibility as including both “personal characteristics, such as skill, effort required, etc., as well as environmental contingencies such as the availability of needed resources, the length of the window of opportunity, etc.” (p. 277). Obviously, there are shared concepts between goal feasibility and the current conceptualization of obstacle manageability. Both imply overall ease or difficulty. Feasibility, however, focuses on the end state, while manageability is meant to describe the obstacles blocking attainment of the end state. Further, feasibility results from contrasting desired goals with current reality and developing expectations (Oettingen & Kappes, 2009). In contrast, obstacle manageability does not require a comparison with a desired future. Instead, the focus is simply to determine if one has the resources to overcome an obstacle that poses as a current and salient threat. The emphasis of the this project is to investigate how persistence towards a difficult (yet attainable) goal is maintained in the face of an unmanageable obstacle.

It bears repeating that the scope of the current investigation involves goals in which a basic requirement is already met. For instance, not everyone has the requisite skills to pitch strikes for the New York Yankees. However, if one does indeed have the resources to pitch in the major leagues, then the way in which certain obstacles are construed can serve as an advantage or disadvantage in dealing with related obstacles. In
particular, when an individual is in possession of the required resources to achieve a
difficult goal, yet an obstacle is made salient and determined to be unmanageable, then
abstract construals would prove more adaptive by maintaining persistence through a
focus on the superordinate goal, in contrast to concrete construals which simply make the
futility of overcoming the unmanageable obstacle more significant.

Goal Persistence

Persisting towards a difficult goal despite unmanageable obstacles contributes to
adaptive functioning as successful goal achievement provides a boost in self-esteem as
well as develops confidence in acquiring and using new skills (Gollwitzer & Moskowitz,
1996). Research has demonstrated that goal persistence includes keeping a goal active
when obstacles that are present might deactivate it. Förster and colleagues (2005)
proposed that goals enhance accessibility of goal-related constructs as long as the goal
remains unfulfilled. For goal pursuit to be successful, goal-relevant information must be
activated in order to serve as a bridge between intention and action. The activation of
intention related constructs enables the individual to effectively identify goal relevant
cues in the environment thus paving the way for successful goal attainment. Once the
goal is achieved, then goal-related constructs will lose their functionality as they may
interfere with newer, more necessary tasks, thus leading to a reduction in accessibility
(Liberman & Förster, 2000; Zeigarnik, 1927). Models of goal hierarchies claim as much,
posing that goal attainment is followed by the reinstatement of higher-order, more
abstract goals (Carver & Scheier, 1999; Vallacher & Wegner, 1987). However, as long
as the goal remains unfulfilled, accessibility of goal related constructs remains until the
individual achieves the goal or disengages from it. In fact, if the goal remains unfulfilled, goal-related constructs may remain active over an extended period of time often resulting in rumination and intrusive thoughts (Lewin, 1951, Martin & Tesser, 1996; Watkins, 2008).

In addition, and in line with other expectancy-value models (Fishbein & Ajzen, 1974; Vroom, 1966), Förster and colleagues suggest that the individual’s perceptions of expectation and value combine to determine motivation to achieve the goal. As a result, the accessibility of goal related constructs (and thus goal persistence) increases with the goal’s expectancy and value (Förster et al., 2005). For example, an individual’s motivation to pursue a goal increases with the goal’s attractiveness and estimated chances of achieving the goal. Therefore, if the goal is not very attractive to begin with, then motivation to pursue the goal would be low no matter the expected chance of success. Similarly, if the chance of success is low, the motivation to pursue the goal would also remain low even if the value of the goal is high. This combination of scenarios, however, does not explain instances when individuals continue to persist towards a goal despite challenging odds.

As such, the current paper offers an additional scenario in which the individual continues to persist towards a highly valued goal despite extremely challenging (yet realistic) expectations. Just as motivation has an effect on goal persistence via accessibility of goal-related constructs, perhaps level of construal has its influence at the point of expectations. Specifically, Förster and colleagues contend that goal persistence is less likely to be maintained when expectancy is low. The assumption is that the
concrete details of the obstacles make the difficulty of the task salient, thus resulting in lowered expectations. However, perhaps maintaining abstract representations concerning the task instead prevents expectations from decreasing by keeping a focus on the goal rather than the obstacles. Additionally, the representations of abstract construals are superordinate in nature, and therefore tend to approximate more idealized values naturally leading to an increase in the attractiveness of the goal (Carver & Scheier, 1990; Fishbach & Shah, 2006; Powers, 1973). Taken together, persistence on a goal that is difficult (i.e., low expectations) can indeed be maintained by virtue of abstract construals which divert focus from the deflating concrete obstacles and instead towards the more positive superordinate features of the goal (i.e., high value). As a result, goal persistence on a difficult task is maintained through abstract thought by regulating expectations which keeps goal-related constructs accessible and increasing motivation to fulfill the goal.

Continued pursuit of difficult goals often result in short-term costs such as tedium, over-expenditure of effort, or perhaps embarrassment and decreased self-efficacy due to lack of success (Williams and DeSteno, 2008). Despite potential costs, however, Gollwitzer and Moskowitz (1996) maintain that meeting goals and the development of skills through goal perseverance are central to adaptive functioning. In other words, although some goals may be difficult and are met with short-term expenses, the positive effects of long-term rewards require that some difficult goals be fulfilled. Without such perseverance, long-term goals might never be realized. On the other hand, perseverance (usually on a highly valued goal) and eventual success when faced with short-term costs
has positive effects on the self-concept while also building skill sets and perhaps increasing social status.

Research has thus investigated the mechanisms that allow individuals to persevere in the face of short-term costs. For example, making certain plans towards goal achievement induces an implemental mindset that helps focus the individual by disregarding irrelevant information while at the same time maintaining desirability (Gollwitzer, Fujita, & Oettingen, 2004). In addition, self-efficacy and positive expectations can increase acceptance of short-term costs by maintaining focus on long-term goal achievement (Bandura, 1982; Bandura & Wood, 1989). Likewise, Williams and DeSteno (2008) have proposed the emotion of pride as a mechanism that might increase perseverance on tasks that involve initial costs. The experience of pride in accomplishing a goal can motivate an individual to continue pursuit in the accomplished domain. Their theory is based on the view that positive emotions facilitate adaptive behaviors by encouraging an individual to aspire towards future achievement and providing the necessary motivation for future success (Fredrickson & Branigan, 2001). Williams and DeSteno (2008) go on to make an important distinction between the positive emotions related to pride and a general positive state which does not necessarily lead to increase effort when faced with initial costs (i.e., the hedonic contingency hypothesis; Wegener & Petty, 1994). In their studies, feelings of generalized positivity did not lead individuals to persevere on tedious tasks. However, feelings of pride mediated increased perseverance on comparable tasks (Bartlett & DeSteno, 2006, Williams & DeSteno, 2008). Along similar lines, Lench and Levine (2008) showed that
a general positive outlook is not necessary in order to elicit increased persistence. Instead, negative emotions (i.e., anger) can also lead to increased goal persistence in the face of initial failure.

The current project attempts to offer yet another mechanism that might also impact goal perseverance, especially on tasks that incur short-term costs but reap long-term benefits. Similar to the effects of pride on motivation, perhaps abstract construals help maintain focus on the benefits of succeeding on a highly valued goal despite pending difficulty. Furthermore, it is not the contention of the current project that persistence via abstract construals is a result of a generalized positive state. Instead, persistence can emerge from frustration that results from having a valued goal blocked. Stated differently, although abstract construals may direct your focus away from obstacles that could lead to goal disengagement, it doesn’t mean that optimism is the requisite result. As such, perhaps abstract construals allow you to be hopeful without being overly optimistic; persistent yet realistic. After all, persistence in the face of obstacles is often seen as a virtue (Janoff-Bulman & Brickman, 1982), even contributing to positive health and well-being (Snyder et al., 1991; Taylor & Brown, 1988). It would seem, then, that the success of achieving a goal would be sweeter knowing that difficulties were overcome. To borrow from Robert Frost, successfully taking the road less traveled makes the trip worthwhile in the end.

The purpose of the present research is to further investigate the advantages and disadvantages of concrete and abstract construals when faced with a difficult task where the obstacles are unmanageable. The goal is to demonstrate that concrete construals,
usually beneficial when faced with a difficult task, are instead maladaptive when the obstacles inherent in the task are unmanageable. Therefore, thinking concretely about the obstacles would provide no anticipatory help, perhaps increase worry, and may in fact lead to goal disengagement from a task that would otherwise have been completed if only the focus remained on the “big picture.” It is predicted here that construing such a task abstractly frees one’s cognitions of obstacles that are insoluble, keeps the superordinate goal active, maintains persistence, and leads to better task performance. It is a currently held belief that concrete construals serve as a beneficial strategy that increases preparation (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996). This strategy, though, may prove disadvantageous if the obstacles are indomitable.

The specific intent of this paper is to (a) demonstrate that abstract construals, in contrast to concrete construals, can benefit performance on a difficult task, (b) further investigate the role of obstacle manageability, and (c) investigate planning, working memory capacity, and energization as possible mechanisms.
Overview of Study 1

Consensus holds that concrete construals are most adaptive when faced with a difficult, novel, or stressful situation, such that it maps out a plan and makes salient the potential obstacles to achieving a goal. Indeed, the essence of self regulation is the ability to balance long-term, abstract goals with more immediate, concrete events (e.g., Mischel, Shoda, & Rodriguez, 1989; Rachlin, 2000; Trope & Liberman, 2003). Contrary to consensus, however, the intent of Study 1 is to demonstrate that abstract construals can indeed be adaptive and benefit performance on a difficult task.

Dweck and Leggett (1988) proposed a framework relevant to mental representations and performance. Specifically, they identified two classes of goals that have particular implications in the domain of intellectual achievement (a domain that is of particular relevance to the present research). The individual who focuses on performance goals is simply concerned with securing favorable judgments about his or her competence. In contrast, the individual who focuses on learning goals is more concerned with increasing his or her competence. Each goal fosters a different behavioral response. A performance mindset is more likely to lead to maladaptive, “helpless” responses characterized by the avoidance of challenges and poor performance in the face of obstacles, whereas a learning mindset is more likely to lead to more adaptive “mastery-oriented” responses characterized by the seeking of challenges and continued goal striving in the face of obstacles (Diener & Dweck, 1978, 1980; Dweck & Reppucci, 1973; Dweck, 1975; Dweck & Leggett, 1988)
A series of studies conducted by Diener and Dweck (1978, 1980) investigated the effects of each mindset on goal striving and performance. Participants who were identified as having either the helpless or mastery-oriented mindset worked on an academic achievement task where their initial success on task problems was eventually met with failure. At the onset of failure, the helpless mindset participants viewed their difficulty as a product of low ability, the task as insurmountable, their effort as futile, and showed marked decrements in performance. On the contrary, when confronted with difficulty, the mastery-oriented participants viewed the unsolved problems as challenges which could be addressed with increased effort, maintained positive affect toward the task, and even showed improvement in performance (See also Brunson & Matthews, 1981; Licht & Dweck, 1984).

This research suggests that when faced with a difficult task, individuals with a performance orientation will respond inadequately, whereas those with a mastery orientation will counter with more adaptive responses. In regards to the present research, setting performance goals focuses one on the task at hand. Therefore, it seems best to approach such a task concretely such that the path towards success is detailed and mapped out which allows for an alternative strategy for anticipated obstacles. Of course, when the task’s obstacles are easily overcome, then a focus on the details and its requirements is a benefit that leads to clear success. However, when the task is difficult, then a performance focus characterized by concrete thought makes salient the obstacles that present the task as problematic, which in turn leads to a helpless response typified by the avoidance of further challenges, task failure, and perhaps even disengagement from
the goal. On the other hand, by setting learning goals, one’s focus is more on the abstract purpose of mastering the challenge, despite initial failures and apparent obstacles. This high-level thought leads to a mastery-orientation which is characterized by persistence, continued goal striving, and even task success. The idea of concrete construals being maladaptive in the face of difficult tasks portends the goal of this paper.

Similar to Dweck’s dyad of learning versus mastery-oriented mindsets, Freitas, Gollwitzer, and Trope (2004) also outlined a dichotomy that implemented mentalities consistent with abstract and concrete construals. In particular, Freitas and colleagues showed how levels of construal can have differing effects on the type of self-regulatory feedback one prefers. They theorized that an abstract mindset makes salient the high-level aims of a situation and thus would make preferable more negative (although more accurate) feedback with a focus on its long term benefits. In contrast, concrete mindsets highlight the low-level experiences and thus would make preferable more positive (although less helpful) feedback with a focus on its immediate, concrete benefits. The trade-off, therefore, was between seeking immediate, concrete benefits through positive but less helpful feedback, or seeking long-term, abstract benefits through negative but accurately helpful feedback.

Participants in their study were induced with either an abstract or concrete mindset and then were given an opportunity to indicate their preference of providing either accurate, long-term feedback that highlighted others’ personal weaknesses or positive, immediate feedback that maintained others’ emotional wellbeing. Findings from their study showed that the type of construal induced influenced the salience of
outcomes that feedback would provide. Specifically, participants induced with an abstract mindset, relative to those with a concrete mindset, were more likely to expect and in turn provide accurate rather than enhancing feedback with a focus on its long-term benefits. Participants induced with concrete construals, on the other hand, expected and preferred to provide others with positive and more emotionally enhancing feedback with a focus on its immediate benefits (Freitas et al., 2004). In sum, inducing an abstract mindset made salient the value of negative feedback (as it relates to future improvement) over its immediate unpleasantness. Considering the abstract how versus the concrete why one would engage in an action thus influences the goals that one endorses and has implications on self-regulation.

When the task is difficult and the path to success is riddled with obstacles, it’s understandable to become disheartened or disengage from the goal when focus is placed on the short-term costs and away from the long-term benefits. In fact, there is a dilemma of self-control when short-term outcomes conflict with long-term outcomes, especially when the short-term outcomes are severe but fleeting, and the long-term benefits are enduring (Metcalf & Mischel, 1999; Mischel, 1974). For instance, seeking a doctorate may seem like an exercise in futility to some when focused on the short term obstacles (e.g., comprehensive exams, dissertation proposal and defense, financial insecurity), but the long-term benefits (e.g., contributing to science, working in academia) are worthwhile if one can just manage to “see the forest through the trees” (Trope, 2004).

Trope and Fishbach (2000) suggested that people may exercise counteractive control which involves a variety of cognitive, affective, and motivational processes in
order to counteract the influence of short-term costs and assure long-term outcomes. Relevant strategies include delay of gratification (Metcalf & Mischel, 1999; Mischel, 1984) and implementation of intentions (Gollwitzer, 1990; Gollwitzer & Brandstatter, 1997; Kuhl, 1984). In addition, people may impose penalties on themselves when failing to act in the interest of their long-term goals (Ainslie, 1975), they make rewards contingent on actions that work toward their long-term goals (Brickman, 1987), or they reinforce the value of behavior that has long-term consequence (Mischel, 1984).

Perhaps the current research contributes another counteractive self-control strategy such that the long-term benefits only apparent through abstract thinking clearly outweigh the short-term costs made salient by concrete thought. The benefits of concrete construals are well documented when the obstacles inherent in the task are manageable, but may not be so when the obstacles are unmanageable. The purpose of Study 1, therefore, is to set a foundation and simply demonstrate that there are instances of task difficulty when abstract construals lead to better performance compared to concrete construals. Specifically, participants will be induced with either an abstract or concrete construal mindset after which they will complete an easy or difficult anagram task. It is predicted that abstract construals will prove more adaptive in the difficult task compared to concrete construals. Subsequent to the results, it will then be possible to further investigate the nuances of certain difficult tasks that make abstract construals more adaptive.
Hypotheses

Hypothesis 1: Impact of construals on easy anagram task performance. Consistent with existing literature, it is predicted that participants induced with concrete construals will answer more items correct on the easy anagram task compared to participants induced with abstract construals.

Hypothesis 2: Impact of construals on difficult anagram task performance. Contrary to existing literature, it is predicted that participants induced with abstract construals will answer more items correct on the difficult anagram task compared to participants induced with concrete construals.

Hypothesis 3: Performance and feelings of motivation. To further investigate relevant relationships, a positive correlation is predicted between the number of anagrams answered correct and feelings of motivation. Across the interaction between construal level and task difficulty, participants who report higher motivation towards the task will also record better scores on the anagram task relative to those less motivated.

Hypothesis 4: Performance and feelings of preparedness. A significant positive correlation between number of anagrams answered correct and feelings of preparedness is also predicted. Participants who report stronger feelings of preparedness will record better scores on the anagram task relative to those who report feeling less prepared.

Hypothesis 5: Performance and feelings of state anxiety. A significant negative correlation between number of anagrams answered correct and feelings of state anxiety via the STAI is predicted. Participants who perform well on either anagram task will report less anxiety than those who do poorly.
Hypothesis 6: Motivation and number of items skipped. It is predicted that participants who report higher levels of motivation will skip less items on the anagram task than participants who are less motivated. Therefore, increased levels of motivation will be associated with increased effort.

Method

Participants

Seventy-eight participants were recruited from introductory psychology courses at Ohio University in partial fulfillment of course requirement and randomly assigned to conditions of a 2 (Construal Level: abstract vs. concrete) X 2 (Task Difficulty: easy vs. difficult) between-subjects factorial design.

Measures

Anagram task. The anagram task comprised of 20 jumbled words which were to be unscrambled by the participant to form a legitimate word. Specifically, the easy anagram task (referred to in the experiment as “Set A”) consisted of 4 letter anagrams (see Appendix A), whereas the difficult anagram task (“Set B”) consisted of 7 letter anagrams (see Appendix B). A single anagram was shown on the computer screen, and participants were required to enter an answer before continuing. If unable to solve the anagram, participants were also given the opportunity to skip to the next anagram by entering their answer as “S.”

State-Trait Anxiety Inventory. The State-Trait Anxiety Inventory (STAI) is a self-report measure meant to evaluate state and trait anxiety (Spielberger, 1983). The essential qualities measured by the STAI are feelings of apprehension, tension,
nervousness, and worry. The present study specifically used the STAI S-Anxiety scale that consists of statements that evaluate participants’ current state of anxiety or how they feel “right now, at this moment.” For each statement, participants indicated their response on a 4-point scale anchored by 1 = not at all and 4 = very much so. Higher scores indicate increased anxiety (see Appendix C).

Preparedness and Motivation. Participants rated how prepared they felt and how motivated they were concerning the anagram task. The preparedness measure was a revised version of the original used by Sanna, Chang, and Meier (2001), and consisted of three questions that asked participants to rate the extent to which they felt prepared, the extent to which they felt they could handle, and the extent to which they felt ready to deal with the anagram task. Motivation was measured by one question that simply asked how motivated they felt concerning the anagram task. Answers to each question were presented along a 9-point scale anchored by 1 = not at all and 9 = very much so.

Procedure

Participants were each seated in a single cubicle in front of a computer through which the experiment was administered via MediaLab (Jarvis, 2005) experimental software.

Difficulty manipulation. The difficulty of the anagram task was manipulated through the instructions for the experiment. Participants first read that the purpose of the experiment was to investigate styles in problem solving, and that they would be asked to solve a series of anagrams. The instructions went on to state that all participants were to be randomly assigned to solve either simple Set A or more difficult Set B anagrams.
Task difficulty was made further salient by way of examples of each anagram set (see Appendix D). In particular, the examples for Set A (easy task) consisted of four letter anagrams along with the corresponding solutions that were simply obvious. Set A examples were juxtaposed with examples for Set B (difficult task) that consisted of seven letter anagrams along with the corresponding solutions that were less apparent. After reading these instructions, the computer ostensibly assigned the participant at random to one of the anagram sets.

Construal-level manipulation. Before moving on to the anagram task, participants completed a construal-level priming manipulation (Freitas et al., 2004) that was described as a supposed survey of students’ opinions and activities. In particular, participants were asked to share their thoughts on maintaining good health. Those assigned to the abstract construal condition were instructed to enter their answers in a succession of boxes that were presented vertically and connected with upward pointing arrows labeled “Why?” (see Appendix E). The box at the very bottom contained the statement “Maintain good health.” Participants were instructed to insert their answer in the box immediately above the bottom box, answering the question why they would maintain good health. Upon providing an answer, participants then completed the next highest box answering why they would engage in their last response, and so on up the page continuing to answer “why” in reference to each new statement. For example, a participant might answer the question “Why do I maintain good health?” with “To live longer.” The format of the exercise would then prompt them to answer “Why live longer?” The structure, therefore, requires participants to think in increasing abstraction
about the activity with each response. Participants provided four responses in this manner.

Those assigned to the concrete construal condition were instructed to enter their answers in a succession of boxes that were presented vertically and connected with downward pointing arrows labeled “How?” (see Appendix F). The box at the very top contained the statement “Maintain good health.” Participants were instructed to insert their answer in the box immediately below the top box, answering the question how they would maintain good health. Analogous to the abstract construal manipulation, participants then completed the next lowest box answering how they would engage in their last response, and so on down the page continuing to answer “how” in reference to each new statement. For example, a participant might answer the question “How do I maintain good health?” with “By exercising.” The format would then prompt them to answer “How do you exercise?” The structure, therefore, requires participants to think in increasing concreteness about the activity with each response. Participants provided four responses in this manner.

Upon finishing the construal level manipulation, participants completed the STAI followed by the preparedness and motivation questions, and finally the anagram task. Thereafter, participants were thoroughly debriefed and thanked for their participation.

Results

Data were collected from 90 participants. However, data from 12 participants were eliminated; 10 because they failed to complete the construal manipulation adequately, and two because they made no attempt to complete the anagram task.
To examine the effect of abstract and concrete construals on performance of easy and difficult anagram tasks, a 2 (Construal Level: abstract vs. concrete) x 2 (Task Difficulty: easy vs. difficult) analysis of variance (ANOVA) was conducted on the number of test items answered correct. In order to standardize the scores between the easy and difficult anagram tasks, data were first converted to \( z \)-scores. The analysis did not reveal any main effects, but did however reveal a significant Construal x Task Difficulty interaction, \( F(1,74) = 5.62, p = .02 \) (see Figure 1).

![Figure 1. Construal level x task difficulty interaction on number of anagrams answered correct.](image)

The means and standard deviations for number of items answered correct on the anagram task as a function of construal level and task difficulty are presented in Table 1.
Table 1

Number of Items Answered Correct as a Function of Construal Level and Task Difficulty

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Task Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Easy</td>
</tr>
<tr>
<td>Abstract</td>
<td>-.212 (1.18)</td>
</tr>
<tr>
<td>Concrete</td>
<td>.257 (.558)</td>
</tr>
</tbody>
</table>

\[ F(1,74) = 5.62, p = .02 \]

Note: Cell means are converted z-scores. Standard deviations appear in parenthesis.

Follow up tests were conducted to examine the differences among construals for the easy and difficult tasks separately. Comparisons revealed a marginal difference in performance means between construal levels in the easy task condition, \( F(1,74) = 2.77, p = .10 \). As predicted, participants primed with low-level, concrete construals performed better (\( M = .26, SD = .56 \)) on the easy anagram task compared to those primed with high-level, abstract construals (\( M = -.21, SD = 1.18 \)). Similarly, marginal differences were found in performance means between construal levels in the difficult task condition, \( F(1,74) = 2.86, p = .09 \). Participants primed with abstract construals completed more anagrams correct (\( M = .25, SD = 1.10 \)) on the difficult task compared to those primed with concrete construals (\( M = -.27, SD = .65 \)).

In addition, correlation coefficients were computed to investigate further relationships. Variables included the converted z-scores, percentage correct (the number of anagrams answered correct relative to the number of items attempted), number of
items skipped (also converted to z-scores), answers to each of the three preparedness questions, feelings of motivation, and STAI scores. The results of the correlational analysis are presented in Table 2. Notably, the number of items answered correct were positively correlated with feelings of motivation and the extent to which participants felt prepared for the anagram task, and negatively correlated with scores on the STAI. Further, the percentage of items answered correct were positively correlated with each of the preparedness questions. Finally, motivation scores were negatively correlated with the number of anagrams skipped. This assumes, therefore, that increased levels of motivation were related to more effort by way of persistence in trying to solve each anagram as opposed to giving up so easily. In general, the results suggest that success on the anagram task was related to increased feelings of motivation and preparedness along with reduced anxiety. Further, the more motivation participants felt towards the anagram task, the more effort they invested and the fewer items they skipped.
Table 2

Correlation Coefficients among Study 1 Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>Items answered correct</th>
<th>Percentage correct</th>
<th>Items skipped</th>
<th>Preparedness 1</th>
<th>Preparedness 2</th>
<th>Preparedness 3</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage correct</td>
<td></td>
<td>.61**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Items skipped</td>
<td>-.63**</td>
<td>-.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparedness 1</td>
<td>.30**</td>
<td>.28*</td>
<td>-.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparedness 2</td>
<td>.11</td>
<td>.27*</td>
<td>-.03</td>
<td>.63**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparedness 3</td>
<td>.09</td>
<td>.24*</td>
<td>.00</td>
<td>.71**</td>
<td>.84**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>.30**</td>
<td>.21</td>
<td>-.26*</td>
<td>.65**</td>
<td>.43**</td>
<td>.59**</td>
<td></td>
</tr>
<tr>
<td>STAI</td>
<td>-.30**</td>
<td>-.30**</td>
<td>.06</td>
<td>-.43**</td>
<td>-.41**</td>
<td>-.40**</td>
<td>-.40**</td>
</tr>
</tbody>
</table>

** - Correlation is significant at the 0.01 level (2-tailed).
* - Correlation is significant at the 0.05 level (2-tailed).

Study 1 Discussion

Previous research in mental construals describes concrete construals as most adaptive when faced with difficult tasks. Study 1, however, showed that this is not always the case. In particular, participants in the difficult condition performed better on the anagram task when first primed with abstract representations. In addition, feelings of motivation and preparedness for the task were related with success in the task, even when construing the difficult task abstractly. Left ambiguous by Study 1, however, was the nature of the difficult task that allowed for beneficial effects of abstract construals. Study 2 hopes to more clearly investigate the nature of the obstacles inherent in the difficult condition. In particular, what effect does perceived manageability over the obstacles
have on persistence and performance? Unlike Study 1 where no specifics about the nature of the obstacles were given, Study 2 intends to contrast conditions in which the obstacles can be managed by the individual or not. This distinction is critical in answering the questions generated by Study 1 and in attempting to fill the proposed gap in the construal and self-regulation literature.
Overview of Study 2

The present study plans to build off the foundation that was set in Study 1 by focusing solely on the nature of the difficult condition. In particular, a distinction is made concerning the manageability of the obstacles inherent in the difficult task. The construal and self-regulation literature suggest that concrete construals are more adaptive than abstract construals when faced with a difficult task in that concrete construals lead to more preparedness and thus better task performance (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996). It is argued here, however, that this strategy does not work when the obstacles are unmanageable. Put simply, if there’s nothing you can do about the problem, then you’re better off not even thinking about it. In this case, abstract construals would seem more beneficial in that it removes the focus away from the concrete details which make the unmanageable obstacles salient and more toward the abstract, superordinate purpose of the difficult yet attainable task.

Research documents the benefits of concrete construals without discussing alternate possibilities concerning obstacle manageability. Rivkin and Taylor (1999) examined the role of mental simulations in coping with negative events. Specifically, they concluded that simulating an ongoing stressful event would facilitate problem solving and emotion regulation. Further, thinking concretely about a stressful situation resulted in fewer behavioral (and mental) disengagement (Folkman & Lazarus, 1980; 1985; Forsythe & Compas, 1987). Essential in their event simulation theory is that participants thought concretely about the stressful situation. Instructions guided participants to go over the event “in detail” and remember “step-by-step all the specific
things” related to the event. Importantly, Rivkin and Taylor (1999) made the point that the events and the inherent obstacles involved in their study could be managed by the participants. “Both efforts to change the problem and to regulate one’s emotions can be used to cope with controllable problems, whereas uncontrollable problems are…less amenable to active coping strategies” (Rivkin & Taylor, 1999, p. 1452). According to their theory, therefore, concrete construals are no longer adaptive when relevant obstacles are no longer manageable.

In a similar study, Pham and Taylor (1999) demonstrated the benefits of concrete construals, this time on academic performance, but again only with focus on activities that were manageable. Students who envisioned specific steps, such as reading more, increasing study hours, and more detailed planning, performed better on a midterm than students who abstractly envisioned a positive outcome. Again, the route to success included activities that could be addressed by the individual. The possibility of a task that included obstacles that were unmanageable was not considered.

If perhaps the goal includes obstacles that are unmanageable, then research suggests that the goal will be conceded. Carver and Scheier (1982, 1990, 1998) outlined a rough dichotomy of results when they proposed that a person will maintain or renew efforts towards a goal if the assessment of success if favorable, or will disengage from the goal if it seems unattainable (via the inherent obstacles). This again does not explain scenarios where individuals have persevered and succeeded even when the goal was considered out of reach. Adversity implies perseverance despite constant obstacles, even if said obstacles are unmanageable.
Also included in their research is the notion of time frames over which information is considered when monitoring progress towards a goal. Specifically, the time period over which information is assessed can have important implications on the subjective experience as well as expectations of success (Carver & Scheier, 1990). Constant assessment in short periods of the rate of progress towards a goal may be disadvantageous such that the natural deviations to and away from a goal – especially difficult ones – become salient and may lead to an assumption of lack of progress. In contrast, a more expansive view of goal pursuit taken at longer intervals averages erratic deviations from the standard, thereby providing a blurred (more abstract) appraisal of progress (Carver & Scheier, 1990). Granted, taking such a broader view can be disadvantageous in that it makes one insensitive to meaningful changes in goal progress, but the risk is worth it especially if the more abstract approach prevents premature goal disengagement which is more likely on difficult tasks that would show more input fluctuation.

The more abstract a goal is represented, the more important the goal becomes to the general sense of self, and the less likely one is to disengage from the goal (Martin & Tesser, 1996; Watkins, 2008). While abstract construals may be unconstructive under circumstances of novelty or difficulty because of limited guidance on what to do next, concrete construals may be equally unconstructive when they cannot provide solutions to the suddenly salient obstacles. Abstract construals, then, can provide a certain distraction from obstacles that one cannot address, while at the same time maintaining pursuit towards the goal. It is the purpose of Study 2 to tease out this difference in task difficulty
not previously examined. Specifically, under the prospect of a difficult (but still attainable) task, concrete construals will lead to better performance when the obstacles are perceived to be manageable, as evidenced by previous literature. However, abstract construals will lead to better performance on a difficult anagram task when the obstacles are perceived to be unmanageable. Obstacle manageability will be manipulated via a reading task that primes participants into thinking that the physiological effects of anxiety can or cannot be managed under difficult situations.

Hypotheses

*Hypothesis 1: Construal level and obstacle manageability interaction on task performance.* It is predicted that a significant difference in performance means will result from the interaction of construal level and obstacle manageability on the difficult anagram task. Consistent with the results of Study 1, participants induced with abstract construals will complete more anagrams correct on the difficult anagram task than participants induced with concrete construals when primed with the idea that obstacles inherent in the task are unmanageable. In contrast, participants induced with concrete construals will outperform those induced with abstract construals when primed with the idea that obstacles inherent in the task are manageable.

To further highlight the current project’s suggestion that abstract construals are most beneficial when the obstacles made salient are unmanageable, it is predicted that participants in the unmanageable condition will outperform those in the manageable condition when induced with abstract construals. Meanwhile, participants in the manageable condition will outperform those in the unmanageable condition when
induced with concrete construals, supporting existing literature that concrete thought is most beneficial when faced with obstacles that can be addressed by the individual (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996; Vallacher & Wegner, 1987).

Hypothesis 2: Feelings of motivation. Participants induced with concrete construals will feel less motivation towards the task when in the unmanageable condition compared to those in the manageable condition. Focus on obstacles that cannot be managed by the individual negatively impacts motivation compared to focus on obstacles that are difficult yet can be addressed (Diener & Dweck, 1978, 1980; Oettingen, 2000; Oettingen et al., 2001). In contrast, participants induced with abstract construals will show no difference in level of motivation. This is consistent with literature that contends no effect of task difficulty on levels of motivation because of the abstract focus on the prepotent goal (Brunstein & Gollwitzer, 1996; Trope & Liberman, 2003).

Hypothesis 3: Feelings of preparedness. Participants induced with concrete construals will report poorer feelings of preparedness for the anagram task in the unmanageable obstacle condition than participants in the manageable obstacle condition. Construing the task in concrete terms allows individuals to anticipate and outline plans to deal with potential obstacles that can be addressed. However, concrete thought will also make salient the surmounting difficulty when unable to manage the anticipated obstacles leading to decreased feelings of preparedness (Sanna, 1996; Sanna et al., 2006). In turn, participants induced with abstract construals will report no difference in feelings of preparedness between the unmanageable and manageable obstacle conditions due to the
superordinate focus on the abstract goal (Trope & Liberman, 2003; Wegner & Vallacher, 1986).

**Hypothesis 4: Feelings of anxiety.** It is predicted that participants in the concrete construal condition will report higher levels of anxiety via the STAI when the obstacles are unmanageable compared to when the obstacles are as manageable. Participants in the abstract condition, however, will show no difference in anxiety within the obstacle manageability conditions. Anxiety can be initiated by the threat of a difficult task. Concrete thought, therefore, should lead to a reduction in anxiety in the manageable obstacle condition due to a successful search for a solution, but an increase in anxiety in the unmanageable condition due to lack of solutions (Borkovec et al., 1998; Tallis & Eysenck, 1994).

**Method**

**Participants and Design**

One hundred thirty-eight participants from introductory psychology courses at Ohio University participated in partial fulfillment of course requirement and were randomly assigned to conditions of a 2 (Construal Level: abstract, concrete) x 2 (Obstacle Manageability: manageable, unmanageable) between-subjects factorial design in order to examine the effects of construal level and obstacle manageability on performance of difficult anagrams.
Measures

Anagram task. The anagram task and its administration was the same as that used in Study 1. However, because the primary focus was on difficult tasks, participants were assigned only to the difficult anagram set.

State-Trait Anxiety Inventory. The State-Trait Anxiety Inventory (STAI) was the same as that used in Study 1.

Preparedness and Motivation. The preparedness and motivation measures were the same as those used in Study 1.

Procedure

Participants were seated in a single cubicle in front of a computer through which the experiment was administered via MediaLab (Jarvis, 2005) experimental software.

Difficulty salience. Because the present study focused solely on features of difficult tasks, the anagram task did not vary according to difficulty per se. However, task difficulty was made salient via the relevant instructions. As in Study 1, participants first read that the purpose of the experiment was to investigate styles in problem solving, and that they would be asked to solve a set of anagrams. The instructions then stated that all participants would be randomly assigned to solve either a simple Set A or a more difficult Set B anagrams. Task difficulty was then made salient by way of examples of each anagram set (see Appendix D). Like in Study 1, the difficulty of the 7 letter anagram examples of Set B appeared more salient when juxtaposed with the 4 letter anagram examples for Set A. After reading these instructions and viewing the examples,
the computer ostensibly assigned the participant at random to one of the anagram sets. Unlike in Study 1, all participants were assigned to the difficult anagram set (Set B).

*Construal-level manipulation.* At this point, participants completed the construal-level priming manipulation used in Study 1 which again was described as a student survey of opinions. Consequently, participants in the abstract condition were instructed to consider the “why” of completing a certain task, while those in the concrete condition were instructed to consider the “how” (see Appendix E).

*Obstacle manageability manipulation.* After completing the construal-level priming manipulation, participants read a brief statement that described the possibility or impossibility of managing a relevant obstacle (i.e., anxiety) inherent in the difficult task depending on their assigned condition. As part of the study’s alleged purpose of investigating working styles in problem solving, participants in the manageable condition read that “[d]ifficult tasks such as the analogy set that you will be solving have been known to produce anxiety. Fortunately, anxiety is easily manageable.” Participants in the unmanageable condition read a similar statement, but instead learned that anxiety was difficult to manage. Upon reading the statement on the manageability/unmanageability of anxiety, participants were asked to rate how difficult they thought it would be to manage their anxiety on a 7-point scale anchored by 1 = very difficult and 7 = not difficult.

Afterwards, participants completed the STAI followed by the preparedness and motivation questions, and finally the anagram task. Upon completion, participants were thoroughly debriefed and thanked for their participation.
Results

Data were collected from 138 participants. However, data from 15 participants were eliminated; 11 because they failed to correctly complete the construal manipulation and four because they made no attempt to complete the anagram task.

Hypothesis 1: Construal level and obstacle manageability interaction on task performance. To examine the effects of construal level and obstacle manageability on performance of a difficult task, a 2 (Construal Level: abstract vs. concrete) x 2 (Obstacle Manageability: manageable vs. unmanageable) analysis of variance (ANOVA) was conducted on the number of test items answered correct. The analysis did not reveal any main effects, but did however reveal a significant Construal x Obstacle Manageability interaction, $F(1,119) = 7.37$, $p = .008$ (see Figure 2).

Figure 2. Construal level x obstacle manageability interaction on number of anagrams answered correct.
The means and standard deviations for number of items answered correct on the anagram task as a function of construal level and obstacle manageability are summarized in Table 3.

Table 3

*Number of Items Answered Correct as a Function of Construal Level and Obstacle Manageability*

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
</tr>
<tr>
<td>Abstract</td>
<td>4.13 (2.90)</td>
</tr>
<tr>
<td>Concrete</td>
<td>5.57 (2.62)</td>
</tr>
</tbody>
</table>

$F(1,119) = 7.37, p = .008$

Note: Standard deviations appear in parenthesis.

Follow-up tests were conducted to examine differences between construal levels within the unmanageable condition. Comparisons revealed a marginal difference in performance means between construal levels within the unmanageable obstacle condition, $F(1,119) = 2.89, p = .09$. As predicted, and consistent with the results of Study 1, participants induced with abstract construals completed more anagrams correct ($M = 5.77, SD = 2.37$) than participants induced with concrete construals ($M = 4.61, SD = 2.65$) on a difficult task where the salient obstacle is believed to be unmanageable.

Follow-up tests were also conducted to examine differences between construal levels within the manageable condition. Comparisons revealed a significant difference in performance means between construal levels within the manageable obstacle condition,
As predicted, participants induced with concrete construals completed more anagrams correct ($M = 5.57, SD = 2.62$) than participants induced with abstract construals ($M = 4.13, SD = 2.90$) on a difficult task where the salient obstacle is believed to be manageable.

To further highlight that abstract construals are most beneficial when the obstacles made salient are unmanageable, follow-up tests were conducted to examine differences between obstacle manageability within construal levels. Comparisons revealed a significant difference in performance means between the manageable and unmanageable conditions within the abstract construal level, $F(1,119) = 5.94, p = .02$. As predicted, participants in the unmanageable obstacle condition ($M = 5.77$) outperformed those in the manageable obstacle condition ($M = 4.13$) on the anagram task when induced with abstract construals. Within the concrete construal level, comparison tests did not reveal any significant differences in performance means between the manageable ($M = 5.57$) and unmanageable ($M = 4.61$) conditions, $F(1,119) = 1.98, p > .05$.

**Hypothesis 2: Feelings of motivation.** To examine the effects of construal and obstacle manageability on motivation, a 2 (Construal Level) x 2 (Obstacle Manageability) ANOVA was conducted on ratings of motivation concerning the anagram task. The analysis did not reveal any main effects, but again revealed a significant Construal x Task Difficulty interaction, $F(1,120) = 4.89, p = .03$ (see Figure 3).
The means and standard deviations for level of motivation concerning the anagram task as a function of construal level and obstacle manageability are summarized in Table 4. Follow-up tests revealed a significant difference between manageability levels within the abstract construal condition, $F(1,120) = 5.88, p = .02$. Participants induced with abstract construals reported significantly higher levels of motivation when faced with an unmanageable obstacle ($M = 5.90, SD = 1.86$) versus a manageable obstacle ($M = 4.78, SD = 2.21$). In contrast, no significant difference was found between manageability levels within the concrete construal condition, $F(1,120) = .490, p > .05$.

Figure 3. Construal level x obstacle manageability interaction on motivation.
Table 4

*Motivation as a Function of Construal Level and Obstacle Manageability*

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
<td>Unmanageable</td>
<td></td>
</tr>
<tr>
<td>Abstract</td>
<td>4.78 (2.21)</td>
<td>5.90 (1.86)</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td>5.55 (1.48)</td>
<td>5.23 (1.61)</td>
<td></td>
</tr>
</tbody>
</table>

$F(1,120) = 4.89, p = .03$

Note: Standard deviations appear in parenthesis.

In addition, follow-up tests were conducted to examine any construal main effects within obstacle manageability. Tests revealed a marginally significant difference between construal levels within the manageable obstacle condition, $F(1, 120) = 2.81, p = .09$. Participants faced with a manageable obstacle reported higher levels of motivation when induced with concrete construals ($M = 5.55, SD = 1.48$) than when induced with abstract construals ($M = 4.78, SD = 2.21$). While participants faced with an unmanageable obstacle reported higher level motivations when induced with abstract construals ($M = 5.90, SD = 1.86$) as opposed to those induced with concrete construals ($M = 5.23, SD = 1.61$), no significant differences were found between means, $F(1, 120) = 2.10, p > .05$.

**Hypothesis 3: Feelings of preparedness.** An overall preparedness total was computed by summing the totals of the three preparedness questions that asked participants how prepared they felt concerning the anagram task. To examine the effects
of construal and obstacle manageability on preparedness, a 2 (Construal Level) x 2 (Obstacle Manageability) ANOVA was conducted on the totaled ratings of preparedness concerning the anagram task. The analysis did not reveal any significant main effects or interaction. However, analysis of each preparedness question separately did reveal a significant interaction on the third preparedness question which asked participants to rate how “ready” they felt to deal with the anagram task, $F(1,120) = 3.67, p = .05$.

Further analysis revealed a significant difference in preparedness means between those induced with abstract construals versus those induced with concrete construals within the unmanageable condition, $F(1,120) = 4.77, p = .03$. As predicted, participants induced with abstract construals reported significantly greater feelings of preparedness ($M = 6.60, SD = 1.59$) compared to those induced with concrete construals ($M = 5.61, SD = 1.62$) when the salient obstacle concerning the anagram task was framed as unmanageable (see Table 5). Post hoc comparisons did not reveal any significant differences between construal level within the manageable obstacle condition, $F(1,120) = .260, p > .05$ (see Figure 4).

Table 5

| Preparedness Question #3 as a Function of Construal Level and Obstacle Manageability |
|---------------------------------|---------------------------------|---------------------------------|
| Construal Level | Obstacle Manageability | \hline | Manageable | Unmanageable |
| Abstract | 6.03 (2.07) | 6.60 (1.58) |
| Concrete | 6.26 (1.71) | 5.61 (1.62) |

$F(1,120) = 3.67, p = .05$

Note: Standard deviations appear in parenthesis.
Hypothesis 4: Feelings of anxiety. To examine the effects of construal and obstacle manageability on state anxiety, a 2 (Construal Level) x 2 (Obstacle Manageability) analysis of variance (ANOVA) was conducted on the totaled ratings that comprise the STAI S-Anxiety scale (Spielberger, 1983). Items were reverse scored as indicated on the original STAI scale. The analysis revealed a significant obstacle manageability main effect, $F(1,120) = 5.27, p = .02$ (see Figure 5). Across construal level, participants faced with a relevant obstacle that was framed as manageable reported higher levels of anxiety ($M = 19.17$, $SD = 5.13$) than those faced with an unmanageable obstacle ($M = 17.16$, $SD = 4.53$). See Table 6 for a summary of anxiety means.
Figure 5. Construal level x obstacle manageability interaction on feelings of anxiety.

Table 6

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
<td>Unmanageable</td>
<td></td>
</tr>
<tr>
<td>Abstract</td>
<td><strong>19.47</strong> (5.27)</td>
<td><strong>16.93</strong> (5.29)</td>
<td></td>
</tr>
<tr>
<td>Concrete</td>
<td><strong>18.87</strong> (5.05)</td>
<td><strong>17.39</strong> (3.72)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td><strong>19.17</strong> (5.13)</td>
<td><strong>17.16</strong> (4.53)</td>
<td></td>
</tr>
</tbody>
</table>

Obstacle Manageability – $F(1,120) = 5.26$, $p = .02$
Construal X Obstacle Manageability – $F(1,120) = .361$, $p > .05$

Note: Standard deviations appear in parenthesis.

Study 2 Discussion

The purpose of Study 2 was to further investigate instances when abstract construals prove more beneficial to task performance than concrete construals. In particular, the current study attempted to examine the nature of difficult tasks that allow
for the beneficial effects of abstract construals (as seen in Study 1). Participants were
induced with either abstract or concrete construals before completing a difficult anagram
task. Prior to the anagram task, a relevant obstacle was made salient to the participants,
and was framed as being either manageable or unmanageable. The obstacle
manageability manipulation was created to explore a feature of task difficulty not
previously examined in the literature. According to the results, when the obstacle
relevant to the task was framed as manageable, participants induced with a concrete
mindset answered more anagrams correct than those induced with an abstract mindset.
This is consistent with previous research that suggests a relationship between concrete
representations and superior performance on difficult tasks (Norem & Cantor, 1986;
Norem & Chang, 2002; Sanna, 1996). More importantly, and in contrast with existing
literature, when the obstacle relevant to the task was framed as unmanageable,
participants induced with an abstract mindset answered more anagrams correct compared
with those induced with a concrete mindset.

As previously outlined within this paper, past research did indeed investigate the
effects of construals on difficult tasks (e.g., Pham & Taylor, 1999; Rivkin & Taylor,
1999). However, the nature of the difficult task has been unappreciated. Research
conducted involved difficult tasks where the obstacles in question were manageable, and
thus better addressed by concrete construals. If through concrete construals the obstacle
was deemed unmanageable, then the recommendation was for goal disengagement. The
point of the current project, though, is to emphasize that an unmanageable obstacle does
not assume the task itself is impossible. The results from Study 2 add a new perspective
to the relationship between construals and goal perseverance. Specifically, abstract construals can indeed be adaptive when faced with a difficult task. In particular, they are adaptive when the obstacles relevant to the task are unmanageable, such that concrete representations only serve to focus on the unaddressable whereas abstract representations help focus on the prepotent goal.

To begin investigating possible mechanisms that underlie enhanced performance under abstract construals, included in Study 2 were ratings of motivation towards the anagram task. Consistent with predictions, when the obstacle relevant to the task was framed as manageable, participants induced with a concrete mindset reported higher ratings of motivation compared to those induced with an abstract mindset. In contrast, when the obstacle relevant to the task was framed as unmanageable, participants induced with an abstract mindset now reported higher ratings of motivation compared to those induced with a concrete mindset. Furthermore, participants induced with abstract construals reported more motivation especially when the obstacle made salient was deemed unmanageable. If concrete construals are more adaptive for difficult tasks, as research suggests, then tasks that involve unmanageable obstacles will not inspire much motivation. Keep in mind, self-regulation theory suggests goal disengagement as the proper course of action when faced with unmanageable obstacles (Carver & Scheier, 1982, 1990, 1998). However, the current project has outlined a situation where motivation can indeed be preserved (and a goal can be achieved) despite unmanageable obstacles.
Related to motivation are feelings of preparedness. The detailed nature of concrete thought constructively allows individuals to prepare for potential obstacles inherent in a difficult task. However, when obstacles made salient by concrete thought are determined to be unmanageable, then decreased feelings of preparedness are likely to follow (Sanna, 1996, Sanna et al., 2006). Nonetheless, the current study examined the consequences of abstract construals on feelings of preparedness when faced with unmanageable obstacles. Consistent with predictions, when participants were asked to rate how ready they felt towards the anagram task, those induced with abstract construals reported greater feelings of preparedness when the related obstacle was framed as unmanageable compared to those induced with concrete construals. Similar to feelings of motivation, feelings of preparedness towards a difficult task were diminished when concrete representations made salient the unfeasibility of unmanageable obstacles. Abstract representations, on the other hand, helped avoid the discouraging details of unmanageable obstacles while maintaining perseverance towards a difficult yet attainable goal.

Finally, feelings of anxiety were measured via the State Anxiety Inventory (Spielberger, 1983). Participants faced with manageable obstacles reported higher levels of anxiety compared to those faced with unmanageable obstacles. A significant difference in means between interactions of construal level and obstacle manageability was not found. Nevertheless, the resulting manageability main effect can be sensibly explained. Perhaps the anticipation of facing an obstacle that can be managed results in
increased anxiety, whereas unmanageable obstacles do not elicit such anticipatory anxiety regardless of construal level.

The results of Studies 1 and 2 serve as evidence that abstract construals can indeed be beneficial when faced with a difficult task. Specifically, the decontextualized nature of abstract construals should no longer be seen as a disadvantage when dealing with difficult tasks. Instead, the goal relevant features of abstract thought proved advantageous in persisting towards an attainable goal despite unmanageable obstacles. With this discovery, we now begin to investigate possible mechanisms that underlie the positive effects of abstract construals when faced with unmanageable obstacles.
Overview of Study 3

The purpose of study 3 is to go beyond features of obstacles inherent in difficult tasks and investigate the mechanisms by which abstract construals may prove advantageous when faced with hurdles that are unmanageable. What is it that motivates a person to continue to strive for a goal despite the odds? It is the aim of the present study to address the question of how goal commitment emerges when the constraints of reality impede the realization of future objectives. Oettingen and colleagues attempted to address this question via the process of mental contrasting (Oettingen, 1999; Oettingen & Kappes, 2009; Oettingen et al., 2001), such that goal striving and commitment can be achieved by first imagining the attainment of a desired future, and then reflecting on the realities of the present that stand in the way of the desired future. This draws a parallel with the construal literature and the present research such that the representations of the desired future are abstract in nature, while the contrasted obstacles of present reality are concrete in nature (Trope & Liberman, 2003).

The resulting assessment between the desired future and the constraints of reality eventually leads to the development of expectations concerning the task. When the obstacles of reality seem feasible, then expectations are high and the individual will commit to the desired future. However, when the reality seems unfeasible, low expectations result and the individual is less likely to continue towards the goal (Oettingen & Kappes, 2009). It is the contention of the present study, however, that situations may transpire such that individuals will still continue to strive for the desired future despite the unfeasibility of reality. To use the relevant terminology, abstract
construals prevent the individual from dwelling on the negative reality and instead indulge by continuing to envision the wished-for future.

When investigating possible mechanisms involved in the translation of expectations to goal attainment, Oettingen & Kappes (2009) distinguished planning from energization. Consistent with research on defensive pessimism (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996), repetitive thought (Watkins & Baracaia, 2002; Watkins, 2008), and implementation intentions (Gollwitzer, 1999), planning entails concretely mapping out an “if-then” strategy by contrasting the desired future with the constraints of reality. “The procedure of mental contrasting makes obstacles salient, and when recognized as surmountable people commit themselves to overcome them“ (Oettingen & Kappes, 2009, p. 398). This statement, however, only considers one side of the coin and epitomizes the limitations of the existing literature inasmuch as insurmountable obstacles are cast away to eventual goal disengagement. Sometimes, inherent in a difficult yet attainable task, there are obstacles that no amount of planning can deal with. Abstract construals, therefore, help refocus the individual onto the desired future, maintain expectations, and even lead to optimal performance, not by planning, but perhaps through energization.

In contrast to the cognitive makeup of planning, energization is motivational in nature. Specifically, energization (motivational arousal) via desired goals directs attention and effort toward goal-relevant activities (Brehm & Self, 1989; Locke & Latham, 2002; Wright & Brehm, 1989). Especially when people are confronted with a difficult task, focusing on the abstract characteristics of the goal sometimes leads to more
energized efforts than focusing on specific ends (Earley, Connolly, & Ekegren, 1989). If it results in high expectations, mental contrasting can mobilize energy towards reaching the desired goal through actions such as increased effort, positive self-view, and optimistic attributions (Oettingen & Kappes, 2009). In contrast, if the task requires a response that is relatively easy, then little energization is required. For example, in a study in line with the present project, energization was measured in participants who were to perform a task that was framed as either solvable or unsolvable (Wright, Brehm, Crutcher, Evans, & Jones, 1990, Experiment 2). In particular, they were asked to memorize sets of two (easy task), eight (difficult but solvable), or twenty (unsolvable) non-sense trigrams (e.g., SDK LKW) in order to avoid a dreadful noise. Participants in the difficult but solvable condition showed higher energization via subjective as well as physiological measures than those in the unsolvable condition. Likewise, the current paper posits that difficult (yet solvable) tasks can be conquered through a mechanism of motivated energization especially if the focus remains abstractly fixed on the superordinate goal.

In sum, planning and energization are cognitive and motivational mechanisms, respectively, that may help explain the tenets of the current project. In particular, when the obstacles inherent in a difficult task are manageable, concrete construals prove more adaptive as they make salient a specific strategy through planning. In contrast, if the obstacles inherent in a difficult task are unmanageable, then abstract construals are more adaptive as they help sustain focus on the desired goal and maintain goal commitment and striving via energization.
The present study will also consider working memory as a possible mechanism behind the proposed effects. Like the cognitive features of planning, working memory offers a “cold” explanation, as opposed to energization which offers a more “hot,” motivational alternative (Metcalfe & Mischel, 1999). Working memory capacity is identified as the ability to focus attention on a given task while at the same time avoiding distraction from task-irrelevant thoughts (Engle, 2001). Research suggests an association between stress or anxiety and lower levels of working memory capacity (Derakshan & Eysenck, 1998; Eysenck & Calvo, 1992; Klein & Boals, 2001). The saliency of obstacles that result from concrete thought (in addition to task difficulty itself) may elicit anxiety which in turn results in a deficit in working memory capacity. Therefore, working memory capacity is reduced in stressful situations because stress-related thoughts consume cognitive resources necessary in successful task management.

Research concerning working memory capacity indicates that individuals with intact working memory perform better on a variety of cognitive ability tests (La Pointe & Engle, 1990). Schmader and Johns (2003) demonstrated deficits on working memory capacity and performance on a math task as a result of stereotype threat. Similarly, Beilock and colleagues (Beilock, Kulp, Holt, & Carr, 2004; Beilock & Carr, 2005) found support for working memory capacity deficits in relation to theories of choking under pressure. Because of its detail oriented, present-focused nature, concrete construals inherently tap working memory capacity as evident by the fact that both concrete construals and high working memory capacity have been deemed beneficial for difficult tasks (e.g., Beilock & Carr, 2005). And like individuals high in working memory
capacity, those who construe unmanageable obstacles in concrete terms may be more prone to anxiety induced failure than those who think abstractly. Hence, consumption of working memory capacity via anxiety-inducing information denies concrete thinkers the resources required to succeed on difficult tasks that make salient unmanageable obstacles. On the contrary, abstract thought guards against such distractions by establishing focus away from any anxiety-inducing information allowing working memory to operate without interference.

Study 3 offers to build on the foundation established by Studies 1 and 2 by investigating possible mechanisms behind construal level effects on performance depending on the manageability of task obstacles. Specifically, the current study explores the cognitive approaches of planning and working memory capacity, and the motivational approach of energization as a means of support for the benefits of abstract construals under difficult conditions. It is predicted that concrete construals are adaptive when obstacles are deemed manageable by a process of planning, the preservation of working memory capacity, or the combination of both. In contrast, it is predicted that abstract construals prove adaptive when obstacles are deemed unmanageable by a process of motivational energization of behavior. In sum, concrete construals will lead to an increase in planning and the maintenance of working memory capacity, making it beneficial when obstacles are manageable, whereas abstract construals will lead to an increase in energization, making it beneficial when obstacles are unmanageable.
Hypotheses

Hypothesis 1: Planning. It is predicted that participants induced with concrete construals will indicate greater evidence of planning than participants induced with abstract construals. This supports research that posits the advantages of concrete construals as planning strategies (Gollwitzer, 1999).

Hypothesis 2: Energization. In contrast, it is predicted that participants induced with abstract construals will indicate greater evidence of energization than participants induced with concrete construals. This supports the notion of the current paper that abstract construals can serve as a beneficial strategy when focusing on unmanageable obstacles and their deleterious effects.

Hypothesis 3: Working memory capacity and unmanageable obstacles. When faced with obstacles that are perceived as unmanageable, participants induced with abstract construals will perform better on a task of working memory capacity than those in the concrete condition. This assumes that increased distraction associated with the saliency of the unmanageable obstacles after being induced with concrete construals leaves participants with fewer resources dedicated to working memory capacity. In turn, no such distraction exists for participants induced with abstract construals.

Hypothesis 4: Working memory capacity and concrete construals. It is predicted that participants induced with concrete construals will perform better on a task of working memory capacity when obstacles are manageable as opposed to unmanageable. The benefit of planning inherent in concrete construals eliminates any distraction to working memory capacity when faced with manageable obstacles.
Hypothesis 5: Expectations. It is predicted that participants induced with abstract construals will show greater expectations for task success in spite of unmanageable obstacles compared to participants induced with concrete construals.

Method

Participants and Design

One hundred nineteen participants from introductory psychology courses at Ohio University participated in partial fulfillment of course requirement and were randomly assigned to conditions of a 2 (Construal Level: abstract, concrete) x 2 (Obstacle Manageability: manageable, unmanageable) between-subjects factorial design.

Measures

Expectations. Expectations play an integral role in motivation, especially when considering energization as a possible mechanism. Thus, participants’ expectations of the anagram task were evaluated through their responses on the following two questions. First, participants were asked, “How likely is it that you will do well on the anagram task?” This was followed by a second question, “How likely do you think you will complete the analogy task successfully?” Participants answered these questions using a 5-point scale ranging from 1 (not at all likely) to 5 (very likely). Responses were totaled to create an overall score of expectations. The expectation measure is an adapted version of one originally used by Oettingen et al. (2001).

Planning. The strength of commitment to the goal can be inferred from an individual’s implementation intentions (Gollwitzer, 1999). In particular, planning is conditional to the link between anticipated situations and intended behaviors, like those
implied in simple “if-then” statements. Therefore, evidence of planning was measured through the paradigm used by Oettingen et al. (2001). Participants were asked to complete eight sentence stems related to the anagram task presented at random order. Four sentence stems suggested the formulation of plans, whereas the remaining four sentence stems did not imply the formulation of plans (see Appendix G). For example, sentence stems such as “Specifically, I will…” or “I will not…but instead…” imply the formulation of plans. Meanwhile, completing sentence stems such as “In general, I will…” or “I will not…” does not require the formulation of plans. Participants were asked to complete only four of the eight sentence stems “that match best how you’ll think about the anagram task.” The dependent variable was the number of sentence stems chosen that lead to the formulation of plans.

**Energization.** Participants were asked to indicate how energetic, active, lively, and ambivalent (reverse coded) they felt concerning the anagram task. Response scales ranged from 1 (*not at all*) to 7 (*very much*). The responses were combined to create a variable of feeling energized (Oettingen et al., 2001).

**Working memory capacity.** Working memory capacity was measured by a test used by Schmader and Johns (2003), which was adapted from the original developed by Engle and colleagues (La Pointe & Engle, 1990; Turner & Engle, 1989). Participants evaluated simple mathematical equations while memorizing words for later recall. For example, “Is (6 X 8) – 3 = 45?” The answer presented with each equation was either correct or incorrect by plus or minus one. Upon their response, a word was presented for two seconds. The pairing of equation to word was random without replacement. The
words following the equations were selected from a pool of one-syllable words developed by La Pointe and Engle (La Pointe & Engle, 1990; see Appendix H). Nine sets of equation/word combinations were presented to the participant. After each set, the participant was asked to correctly recall each of the words presented in that set. Of the nine sets, three consisted of three equation/word combinations, three consisted of four equation/word combinations, and three consisted of five equation/word combinations for a total of 36 words to be recalled. The order of sets was presented randomly to each participant. The number of words recalled was recorded as a measure of working memory capacity.

Procedure

Participants were seated in a single cubicle in front of a computer through which the experiment was administered via MediaLab (Jarvis, 2005) experimental software.

Difficulty salience. As in Study 2, participants first read instructions that juxtaposed the difficult anagram task with the easy anagram task. Due to potential fatigue from the length of the new measures, and in lieu of the results from Study 2, the actual anagram task was not administered.

Construal-level manipulation. Also like Study 2, participants then completed the construal-level priming manipulation. Consequently, participants in the abstract condition were instructed to consider the “why” of completing a certain task, while those in the concrete condition were instructed to consider the “how” (see Appendix E).
Obstacle manageability manipulation. At this point, participants undertook the obstacle manageability manipulation first used in Study 2 through which they learned that the obstacles inherent in the analogy task are either manageable or unmanageable.

After reading the article, participants completed the expectations, planning, and energization measures, and finished with the working memory capacity measure. Concerning the working memory measure, participants were instructed to evaluate the correctness of the equations as quickly and accurately as possible while also remembering the associated words for later recall. The mathematical equation was presented first, after which participants recorded their evaluation by indicating “1” for correct or “2” for incorrect. After recording their evaluation, the word to be remembered was presented for two seconds. A blank screen lasting one second separated the word from the next equation. After presentation of all the equation/word combinations within the set, participants were prompted to recall all the words from the set. Upon completion of the working memory task, participants were thoroughly debriefed and thanked for their participation.

Results

Data were collected from 119 participants. However, data from 14 participants were incomplete or not properly completed and were thus eliminated. To investigate possible underlying mechanisms for the results collected in Studies 1 and 2, a 2 (Construal Level: abstract vs. concrete) x 2 (Obstacle Manageability: manageable vs. unmanageable) between-subjects ANOVA was conducted on the primary independent
variables which included expectations, planning, energization, and working memory capacity.

**Hypothesis 1: Planning.** A planning variable was created by totaling the number of chosen sentence stems (four from eight possible choices; see Appendix G) that implied the formulation of plans. In particular, the formulation of plans was implied if participants chose to complete sentences stems that began with, “Specifically, I will…,” “Until… I will…,” “If…then I will…,” and “I will not…but instead…” (Oettingen et al., 2001). A two-way ANOVA was conducted to evaluate the effects of construal level and obstacle manageability on planning. The means and standard deviations for planning as a function of the two factors are presented in Table 7. The ANOVA yielded no significant effects for planning.

<table>
<thead>
<tr>
<th>Table 7</th>
</tr>
</thead>
</table>

*Planning as a Function of Construal Level and Obstacle Manageability*

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
</tr>
<tr>
<td>Abstract</td>
<td>1.70 (.669)</td>
</tr>
<tr>
<td>Concrete</td>
<td>1.62 (.622)</td>
</tr>
</tbody>
</table>

$F(1,101) = .025, p > .05$

Note: Standard deviations appear in parenthesis.
Hypothesis 2: Energization. The energization variable was created by totaling responses from questions that asked participants to indicate how energetic, active, lively, and ambivalent (reverse scored) they felt concerning the anagram task. Higher totals indicated greater feelings of energization. A two-way ANOVA was conducted to evaluate the effects of construal level and obstacle manageability on energization. The means and standard deviations for energization as a function of the two factors are presented in Table 8. The ANOVA revealed a significant Construal main effect, $F(1,101) = 4.04, p = .05$. Participants induced with abstract construals reported greater feelings of energization ($M = 15.74, SD = 3.27$) than those induced with concrete construals ($M = 14.55, SD = 3.13$) across manageability levels. Follow-up tests revealed a significant difference between construal levels within the unmanageable condition, $F(1,102) = 4.61, p = .03$. Participants faced with an unmanageable obstacle reported significantly higher levels of energization when induced with abstract construals ($M = 16.10, SD = 2.61$) than those induced with concrete construals ($M = 14.08, SD = 3.00$). No significant difference was found between construal level means within the manageable obstacle condition.
Table 8

**Energization as a Function of Construal Level and Obstacle Manageability**

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
</tr>
<tr>
<td>Abstract</td>
<td>15.48 (3.70)</td>
</tr>
<tr>
<td>Concrete</td>
<td>14.97 (3.24)</td>
</tr>
</tbody>
</table>

*Construal main effect - F*(1,101) = 4.04, *p* = .05

Note: Standard deviations appear in parenthesis.

**Hypothesis 3 and 4: Working memory capacity, unmanageable obstacles, and concrete construals.** A working memory capacity variable was created by calculating the total number of words recalled while also having to evaluate a mathematical equation. The more words recalled indicated increasing availability of working memory capacity. A two-way ANOVA was conducted to evaluate the effects of construal level and obstacle manageability on working memory capacity. The means and standard deviations for working memory capacity as a function of the two factors are presented in Table 9. The ANOVA yielded no significant effects for working memory capacity.
Table 9

Working Memory Capacity (Words Recalled) as a Function of Construal Level and Obstacle Manageability

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
</tr>
<tr>
<td>Abstract</td>
<td>33.24 (3.55)</td>
</tr>
<tr>
<td>Concrete</td>
<td>33.52 (2.10)</td>
</tr>
</tbody>
</table>

\[ F(1,101) = .03, p > .05 \]

Note: Standard deviations appear in parenthesis.

Hypothesis 5: Expectations. An overall score of expectations was computed by totaling responses to two questions that asked participants to rate their expectations concerning the anagram task. A two-way ANOVA was conducted to evaluate the effects of construal level and obstacle manageability on expectations. The means and standard deviations for expectations as a function of the two factors are presented in Table 10. The ANOVA yielded no significant effects for expectations.

Table 10

Expectations as a Function of Construal Level and Obstacle Manageability

<table>
<thead>
<tr>
<th>Construal Level</th>
<th>Obstacle Manageability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manageable</td>
</tr>
<tr>
<td>Abstract</td>
<td>5.83 (1.47)</td>
</tr>
<tr>
<td>Concrete</td>
<td>5.76 (1.66)</td>
</tr>
</tbody>
</table>

\[ F(1,101) = 1.18, p > .05 \]

Note: Standard deviations appear in parenthesis.
Study 3 Discussion

The purpose of Study 3 was to further investigate the mechanisms by which abstract construals prove advantageous when faced with unmanageable obstacles. In other words, what is it that allows an individual to persist towards a goal despite the salience of an obstacle that is practically insurmountable? Participants were again induced with either abstract or concrete construals before they were to supposedly complete an anagram task. An obstacle related to the task was again made salient to be either manageable or unmanageable by the participant. In order to investigate underlying factors that not only maintain goal commitment but actually enhance performance (as seen in Studies 1 and 2), cognitive measures (e.g., planning, working memory capacity) and motivational measures (e.g., energization) were included.

Oettingen and Kappes (2009) offered planning and energization as methods in translating expectations to goal attainment. In the current study, expectations concerning the anagram task were measured and no significant differences resulted. Further scrutiny of the means, however, showed that the predicted trend was achieved. In particular, when faced with an unmanageable obstacle, participants induced with abstract construals reported higher expectations compared to those induced with concrete construals. Although not significant, this helps to paint an overall picture of the motivational and/or cognitive mechanisms at play. Already we see that abstract construals make a slight difference in maintaining expectations. This is important because through abstract representations, expectations of attaining the desired future remain active which determine the person’s commitment and attempt to attain the wanted future (Oettingen &
Kappes, 2009). As a result, motivational arousal (i.e., energization) directs attention and effort toward goal-relevant activities (Brehm & Self, 1989; Locke & Latham, 2002; Wright & Brehm, 1989).

Important to the current study, therefore, are the results concerning energization. Consistent with predictions, a construal main effect was achieved in which participants induced with abstract construals reported higher levels of energization across obstacle manageability than those induced with concrete construals. Especially revealing is that the difference in means between construals is significant when faced with an unmanageable obstacle. Along with maintained expectations, the high levels of energization reported by those induced with abstract construals help individuals maintain goal commitment and possible success despite unmanageable obstacles. Concrete representations of unmanageable obstacles only work to make salient the mounting difficulty of the task. Abstract construals, on the other hand, motivate by facilitating energization that directs attention towards goal related activities which ultimately keeps the superordinate goal active.

The energization variable originated from Brehm’s energization model of motivation (Brehm & Self, 1989) which suggests a connection between task difficulty and outcome attractiveness. In particular, the theory predicts that the appeal of an outcome should increase with task demand up to a certain level of difficulty. Motivational arousal, therefore, is determined by task difficulty, such that energy levels will increase with task demand until costs (in terms of energy requirements) exceed the benefits of successful performance, at which point energization levels are expected to dip.
In sum, easily attained or impossible goals should produce little motivational arousal, whereas difficult to obtain goals should produce relatively high levels of motivational arousal. See Figure 6 for a graphic illustration of Brehm’s energization model.

![Figure 6. Theory of energization (Brehm & Self, 1989): Task difficulty x energization at high levels of motivation.](image)

Evidence for this theory of motivation includes a study by Vought (1977) where task difficulty was manipulated to be easy, difficult, or impossible. Consistent with predictions derived from energization theory, goal attractiveness ratings were found to be higher for subjects in the difficult task condition than for subjects in the easy and impossible task conditions. Wright, Contrada, and Patane (1986) extended Vought’s experiment by including physiological measurements of energization (e.g., systolic blood
pressure responses). Again, participants’ subjective and objective measures of energization were higher for the difficult task compared to the easy and impossible tasks.

The results of Study 3 can be interpreted in light of the principles inherent to energization theory. Specifically, the higher scores for energization among those faced with an unmanageable obstacle and induced with abstract construals in the present study are reminiscent of the elevated scores of participants faced with the difficult tasks in the energization theory studies (Wright, 1992; Wright & Brehm, 1989; Wright et al., 1986). Similarly, the lower scores of energization among those faced with an unmanageable obstacle and induced with concrete construals in the present study evoke the low scores of participants faced with impossible tasks in the same energization studies. Taken together, perhaps this further highlights the advantages that abstract construals can afford. In terms of energization theory, perhaps abstract construals maintain motivational energy by framing a task with unmanageable obstacles as difficult yet still attainable. Conversely, the focus by concrete construals on the unmanageable obstacle of the task frames it as practically impossible, thus contributing to the decrease in motivational energy.

In contrast to the motivational aspects of energization, Study 3 also examined its cognitive associates: planning and working memory capacity. As already mentioned, expectations of a difficult task eventually arise via a process of mental contrasting that makes accessible both the obstacles or reality and the desired future (Oettingen & Kappes, 2009). When the obstacles of reality are made salient and are manageable, individuals can make if-then plans which allow them to actively commit and continue to
strive towards the goal. In Study 3 we hoped to mimic the findings of research that involved successful concrete planning (e.g., Gollwitzer, 1999; Norem & Cantor, 1986; Sanna, 1996). Specifically, it was predicted that as success via abstract construals was fueled by energization, then success via concrete construals would likewise be fueled by planning. Unfortunately, no significant effects were revealed in the present study. This of course is not to say that cognitive mechanisms aren’t involved. A discussion of potential cognitive mechanisms is discussed in the Future Directions section.

Study 3 also considered working memory capacity as a possible mechanism behind the obtained results. Like planning, working memory capacity offered a cognitive explanation, as opposed to the motivational alternative offered by energization. Unlike planning, effects of working memory capacity and energization need not be mutually exclusive. Perhaps both the motivational aspects of energization and the cognitive aspects of working memory capacity work in concert in order to maintain active goal pursuit and achieve successful task performance via abstract construals when faced with unmanageable obstacles and via concrete construals when faced with manageable obstacles. Concerning concrete thought, in particular, it was predicted that working memory capacity would be reduced when the obstacle was framed as unmanageable as thoughts about the insurmountable obstacle would be too distracting. However, the null results from Study 3 again do not allow us to draw any direct conclusions.

Nevertheless, as it relates to working memory capacity, it is interesting to revisit the relationship between anxiety and working memory capacity. Research suggests that anxiety is related to lower levels of working memory capacity as it acts as a distraction
from task-relevant thoughts (Derakshan & Eysenck, 1998; Engle, 2001). Recall in Study 2 that (contrary to initial predictions) participants across construal level reported higher levels of anxiety when faced with a manageable obstacle as opposed to an unmanageable obstacle. This suggests that if decreased working memory capacity is related to increased anxiety which in turn was reported by participants in the concrete/manageable condition of Study 2, then working memory capacity may not be the reason for the resulting success in that condition. In other words, the goal commitment and enhanced task performance evidenced in the concrete/manageable condition together with increased levels of anxiety seems characteristic of a defensive pessimist (Norem & Cantor, 1986; Norem & Chang, 2002; Sanna, 1996). In turn, the lack of success in the abstract/manageable condition (coupled with the increased levels of anxiety) further highlights the importance of concrete thought when obstacles can be planned for. Finally, success in the abstract/unmanageable condition (coupled with lower levels of anxiety) highlights the disadvantages of planned thought and the advantages of energization.
General Discussion

Research on construals, self-regulation, and goal persistence all take into account task difficulty such that for successful self-regulation, concrete construals were regarded as advantageous in representing difficult tasks (due to their detailed ability to anticipate potential obstacles), while abstract construals were deemed useful mostly when the task was easy and a higher level of representation could be constructively achieved (Carver & Scheier, 1999; Vallacher & Wegner, 1987). Further, if the task was believed to be too difficult (as best determined through concrete construals), then goal disengagement was the recommendation for efficient self-regulation. It is the contention of the present project, however, that this perspective is incomplete, and further investigations into the nature of task difficulty were necessary in order to paint a more comprehensive picture. With this goal in mind, we attempted through three studies to first establish an instance when abstract construals would indeed be advantageous in dealing with a difficult task, then to explore the features of the difficult task (namely, obstacle manageability), and finally to consider possible mechanisms that underlie predicted results.

Study 1 challenged individuals with an anagram task and confirmed that success can indeed be achieved through the well-planned nature of concrete construals. However, when juxtaposed against a more difficult task, abstract construals instead proved to be more advantageous. Participants induced with abstract construals performed better on a difficult anagram task compared to those induced with concrete construals. Study 1, therefore, provided evidence contrary to the consensus that concrete construals are more adaptive in difficult, novel, or stressful situations. Although a foundation was
set that demonstrated the benefits of abstract construals under circumstances that were previously believed to be disadvantageous, more research was required to illuminate features of the difficult task that dictated when abstract and concrete construals would be beneficial or detrimental.

Study 2 targeted the nature of the obstacles inherent in difficult tasks as potential explanations for the differing performance effects of mental construals. Specifically, an obstacle inherent in the difficult anagram task (i.e., anxiety) was framed as either manageable or unmanageable. Consistent with predictions of previous literature, participants induced with concrete construals performed better on the difficult task when the related obstacle was framed as manageable instead of unmanageable. In contrast, when the relevant obstacle was cast as unmanageable, participants induced with abstract construals performed better, a result not specifically covered by existing literature. Further scrutiny of the results uncovered that reports of motivation towards the task also varied depending on the construal and manageability of the obstacle. Increased motivation was related to the beneficial effects of concrete construals when obstacles were deemed manageable and of abstract construals when obstacles were deemed unmanageable.

Incidentally, to further investigate the role of motivation on performance as a function of construal and obstacle manageability, an analysis of covariation (ANCOVA) was conducted, but was not found to be significant. The implication is that the mechanism of motivation at present does not statistically mediate the interactive effects
of construal level and manageability on performance. However, it is possible that more sensitive measures might provide significant mediation.

Finally, Study 3 attempted to uncover underlying mechanisms that could help clarify the differential effects of construals on task performance under varying degrees of obstacle manageability and provide support for the beneficial nature of abstract construals. Specifically, cognitive measures such as planning and working memory, and a motivational measure of energization were included after the construal and obstacle manageability manipulations. From the results of Study 3, we began to see additional evidence for a motivational component responsible for the beneficial effects of abstract construals when obstacles are beyond regulation. Specifically, participants who faced an unmanageable obstacle related to their goal reported higher levels of energization when induced with abstract construals than those induced with concrete construals. Intuitively, this is no surprise as abstract construals would be more likely to motivate by representing the goal at a level that does not focus on the unmanageable problem (which more cognitive mechanisms such as planning and working memory might do), but rather on the ultimate goal. Essentially, abstract construals motivate by helping to maintain a “glass half full” mentality. Stories of success where individuals overcome the odds are certainly more motivational in makeup. The very definition of abstract representation is a focus on the ultimate goal and away from the concrete details (which, in a difficult task, many times includes unmanageable obstacles). Therefore, abstract construals maintain motivation to pursue the goal by constructively disregarding those obstacles that cannot be managed.
Perhaps the contributions of this project can be further appraised by balancing the present conclusions against previous evidence for the benefits of concrete construals. Taylor and colleagues (1998) proposed that mentally simulating the detailed process of completing a goal, rather than simply envisioning a successful outcome, produced better progress towards the goal. Similarly, Gollwitzer’s (1999) implementation intentions also suggested that a more detail-oriented mindset was the preferred representation for successful goal attainment. Orthogonally, however, abstract construals may in turn prove more beneficial when the detailed representations offered by concrete thinking make salient obstacles that are unmanageable. When the task is difficult yet attainable and the individual possesses all necessary resources, abstract construals would serve better in maintaining commitment to the goal, whereas the advantages of concrete construals become immaterial when the obstacles are unmanageable.

Likewise, another stated advantage of concrete construals was its mitigating effects on excessive self-focus (Baumeister & Showers, 1986; Beilock & Carr, 2001; Leary et al., 2006). Abstract thoughts of the self (especially ones that focus on the negative consequences of one’s behavior) serve as a distraction from focusing on the task at hand, whereas concrete construals help keep thoughts targeted on the details necessary for goal attainment. Not considered, however, is the potential for concrete thought to be debilitating when obstacles beyond one’s management are made salient. Results from the present project indicated that concrete construals were not beneficial when such a situation was confronted. Again, what in one situation is considered a benefit of concrete construals becomes a disadvantage when the obstacles made salient are unmanageable.
Now the distracting thoughts once only associated with negative self-focus is now initiated at a low-level of representation. The cognitive resources that were once freed up by constructive concrete thought are now expended when obstacles are unable to be dealt with. Abstract construals focused not on the potential implications but instead on the superordinate goal are more adaptive in this case.

As it relates to temporal construal theory (Trope & Liberman, 2003), concrete representations also have a stated advantage in preparation for future tasks. Research on defensive pessimism illustrates that a concrete focus on the potential obstacles and negative outcomes helps certain individuals prepare to prevent these outcomes from ever materializing (Norem & Cantor, 1986; Norem & Chang, 2002). Again, the assumption is that the obstacles related to these negative outcomes are manageable. If unmanageable, then the benefits of concrete construals are essentially negated. Instead, abstract thoughts are now ideal in maintaining goal persistence. Similarly, when the obstacles are manageable, concrete construals have been deemed beneficial for better problem solving (Vallacher & Wegner, 1987; Watkins & Baracaia, 2002). Task difficulty requires identification at a lower level for proper execution and performance. However, when the obstacles within the difficult task are unmanageable, abstract construals would allow for maintained goal pursuit on a task that would have otherwise been abandoned if represented concretely.
Limitations and Future Directions

*Cognitive Mechanisms*

The results from the present project provide some initial evidence for a motivational influence in augmenting the effects of abstract construals on performance of difficult tasks when faced with an unmanageable obstacle. In particular, Studies 2 and 3 showed motivational support via self-reports of motivation towards the anagram task and measures of energization, respectively. Attempts at uncovering more cognitively related mechanisms were at present unsuccessful. However, this does not presume that the search is complete. On the contrary, we perhaps have found a few ways in which cognitive mechanisms were not supported, but by no means should we completely discount the cognitive nature of the effects.

Continued investigation aimed at cognitive mechanisms is prudent as mental representations themselves are described in the literature in mostly cognitive terms. For instance, mental representations develop first through cognitive categorization, or the placement of an object, person, or event into some cognitive class of familiar thing (Bruner, 1957). In addition, the stages of categorization which ultimately lead to some kind of mental representation are obviously very cognitive in nature; beginning with a primitive classification in which the task or event is analyzed for its features, then a cue search is conducted to check against categories that contain similar features, until finally category activation is achieved. Further, the idea of an associated network of knowledge and spreading activation of categories and representations are also framed in very cognitive terms (Collins & Quillian, 1969; Meyer & Schvandeveldt, 1971). As it relates
to the present research, inherent in goal persistence and mental representations are features shared with cognitive processes such as goal selection, implementation, and regulation, each of which has been discussed within this paper. Although the present attempt at finding support for cognitive mechanisms has fallen short, future research can continue to explore possible cognitive undertones that may work in concert with motivational means to better understand the interaction between mental construals and perceptions of task related obstacle manageability.

Expectations

Study 3 was an initial attempt to relate expectations with motivation and goal persistence. Although the study fell short of discovering anything definitive, the function of expectations as it relates to motivation in past literature makes it worthy of further investigation. As Förster and colleagues have suggested, expectation and value combines to determine motivation to achieve a goal (Förster et al., 2005). In sum, if attractiveness of the goal and expectancies of success are high, then motivation will be high as well. Conversely, if expectancy is low, regardless of value, the motivation to pursue the goal would also remain low. Of course, the current project outlines an alternate outcome, such that motivation and persistence toward a goal can indeed be maintained despite low expectations, and especially if the value is high. Is this not the characteristic of the “underdog” success story – maintained motivation and persistence despite incredible odds?

From Study 2 we begin to see how this alternate outcome is made possible through proper understanding of the interaction between task construal and obstacle
manageability. Further exploration of mental construals’ potential influence on expectations may continue to shed light on the subject. The beneficial effects of abstract construals as it relates to difficult (yet attainable) tasks may stem from their ability not only to counter the debilitating effects of a frustrating task, but also to maintain construal at a high-level where more idealized values reside. One may then reason to his or herself, “I really want to achieve this goal [high value], but it’s nearly impossible [low expectations]. But I’m a fighter not a quitter [high-level ideals], so I’m going to continue to try my best [maintained motivation and persistence]!” Lowered expectations, therefore, are counteracted by the motivational properties of abstract construals.

Energization and Performance

Performance measures were not collected in Study 3 in fear of fatigue due to the lengthy dependent measures that followed the construal manipulation. However, in light of the results from Studies 2 and 3, future research should focus data collection on both performance and energization together to investigate the role energization has in the construal-obstacle manageability interaction. In addition, physiological measures of energization similar to those collected by Wright and colleagues (1986) would potentially shed more light on the interaction effects of construal level and obstacle manageability.

Obstacle Features

Future directions may also include a more comprehensive exploration of the obstacles inherent in the difficult task. Currently, the obstacle that was framed as either manageable or unmanageable was singular in nature and a feature intrinsic to the individual (i.e., anxiety). Perhaps it would be useful to determine the limits of obstacle
features that would produce similar effects depending on construal. For instance, perhaps perceptions of obstacle manageability may also be affected by the number of obstacles made salient. In other words, can obstacle manageability also be manipulated by making salient a whole host of obstacles instead of just one? Indeed, individuals have often triumphed over tasks that required persistence over an overwhelming amount of obstacles.

In addition, future research might include obstacles that not only reside with the individual, but instead are inherent in the task or situation. Take for example the obstacle of discrimination due to other’s prejudice. The female executive, the Black president, the racial minor and socio-economically disadvantaged Supreme Court judge were all able to break down stereotypical barriers because they were willing to face difficult tasks riddled with obstacles that were unmanageable. The aspiring executive did not choose her gender, the current American president didn’t choose the color of his skin, nor did the newest Supreme Court judge choose the heritage she was born into. Yet they all undertook, persisted, and succeeded in goals where the major obstacles they faced were the result of the prejudice of others. When fully investigated, the path to achieving success over a difficult goal can then be properly traced. Perhaps a particular solution that one has tried leads to a dead end. Concrete focus on the dead end may lead one to give up the goal. An abstract mindset, however, may help one realize that a blocked goal does not necessarily connote an impossible goal. Perhaps a more superordinate focus will illuminate alternate paths despite the number of road blocks and no matter how daunting.
Pride, Anger, and Perseverance

Study 3 offers evidence for energization as a motivational mechanism that contributes to the beneficial effects of abstract construals. However, by what specific affective means does energization shape effort and impact perseverance on tasks, especially those that include an initial cost? Williams and DeSteno (2008) offer the emotion of pride as capable of guiding goal-directed behavior. Pride, defined as “a positive, self-conscious emotion arising from achievements that can be attributed to one’s abilities or efforts” (Williams & DeSteno, 2008, p. 1007), provides incentive to maintain pursuit of a goal even despite initial obstacles. According to their motivational hypothesis of pride, the authors specify that “achievement oriented” pride, or pride that stems from a specific event rather than having no particular target, is most beneficial when facing such difficult tasks. In their research, pride is further distinguished from self-efficacy and general positive affect by being particularly functional toward a goal that incurs short-term costs. Intuitively, pride would seem to be a very relevant emotion concerning perseverance when a goal is blocked by an unmanageable obstacle, and further research would compliment that of the present study.

While measuring the effects of pride on goal perseverance, Williams and DeSteno (2008) included a measure for effort. Specifically, they measured the time each participant chose to spend on the task at hand (i.e., a mental rotation task). Although not included in our hypotheses, a similar measure of effort was recorded in Studies 1 and 2 to uncover potential effects of construal and obstacle manageability on effort or perseverance on the anagram task. Analyses were run to investigate effects on average
time spent on each anagram as well as average time spent on the whole anagram task. Ultimately, evidence for effects on perseverance as they were currently measured was not obtained. However, perhaps this notion of effort can be explored further in future research.

In a separate set of studies, Lench and Levine (2008) offered the emotion of anger as leading to increased persistence especially after experiencing failure. Participants in their study were asked to complete sets of anagrams, some of which were unsolvable and thus instigating the experience of failure. Their results suggested that anger partially mediated the relationship between goals and persistence. In particular, participants with avoidance goals experienced more anger which partially accounted for greater persistence on the unsolvable anagrams. In contrast to the Williams and DeSteno (2008) research which highlights the motivational properties of pride, we see here that anger can also lead to perseverance when costs are incurred. Therefore, perseverance can be motivated through pride in one’s performance or through angered refusal to not be defeated. Together, research on both pride and anger provides a foundation for future investigation as it relates to affective mechanisms that underlie the effects of mental construals and goal persistence when faced with unmanageable obstacles.
Concluding Remarks

In contrast to existing literature that ascribes a preparative function to concrete construals, the current paper claims that the consequences of mental construals on performance and motivation can only be fully understood when one considers how the manageability of related obstacles interacts with mental construal. Incidentally, it is not the intent of this paper to prove consensus about the benefits of concrete construals wrong, but quite the opposite in fact, as the preparatory functions of concrete construals have presently been made quite clear. It is, however, the purpose of the current research to add an extra appendage to the literature by helping to explain those difficult (yet often inspirational) times when an individual decides to continue towards a goal despite odds that are perceived to be impossible. In these cases, concrete construals do not predict persistence. Yet “miracles” of success over incredible odds would not be possible without a certain mindset that chooses to focus not on the obstacles but instead on the rewards of the final goal.

As it relates to miraculous triumphs, perhaps abstract construals share some elements with religion, where individuals defer to a “higher power” especially in times of despair when obstacles are no longer manageable. Pargament (1997) incorporated attribution theory (1958) in his exploration of how religion is used to deal with difficult tasks or events, and distinguished between a “deferring” style, in which people leave it to God to deal with their problems, a “collaborative” style, in which people believe in a cooperation between God and their own efforts, and a “non-religious” style, in which no appeal is made to God at all. Inherent especially in the collaborative style is the notion
that success is inevitable if faith is maintained and persistence is sustained no matter the obstacles. In fact, the Bible promises that one “can do all things through Christ who strengthens me” (Philippians 6:13). Thus, by deferring the concrete obstacles to a more abstract belief, one is granted the strength to continue pursuit of the goal.

If, as the phrase goes, power is truly in perception, then approaching a task with an abstract mindset is a top-down way of attacking the problem, while concrete mindsets offer a bottom-up construction of the task. When obstacles within a task are unmanageable, abstract construals help by first considering the superordinate goal then work down towards lower level thoughts. Perhaps this offers people the ability to anchor to their goal, keep it active, and persist despite obstacles in the way of success. If, however, concrete construals guide one’s approach, then people may instead anchor onto the obstacles which obstruct proper viewing of the goal. If, in particular, these obstacles are unmanageable, then focusing on the “big picture” goal may prove even more difficult. Nevertheless, when a difficult goal is achieved, there is ultimately a greater sense of satisfaction after having beaten the odds. Brokerage tycoon Charles Schwab once said that “a man can succeed at almost anything for which he has unlimited enthusiasm.” Through the present and subsequent research, perhaps the enthusiasm and focus maintained by abstract construals amidst difficult tasks provides evidence that persistence can indeed be virtuous.
References


Appendix A

ANAGRAM TASK (Easy)

Set A Instructions: The following is a set of 20 anagrams. Unscramble the letters in order to form a word. Place your answer in the space provided. At any time you may choose to skip to the next item by typing an "S" in the first space and hitting ENTER.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EKBA</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. STEB</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. RACS</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. YALC</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. ERAD</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. SDIK</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. OMOD</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. TIFS</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. ELFU</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. GUPL</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. EATH</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. STHO</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. NHIC</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. MEIT</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. MLAB</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. GLES</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. AIRL</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. TENO</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. EHOS</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. ATHW</td>
<td>Answer:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Set B Instructions: The following is a set of 20 anagrams. Unscramble the letters in order to form a word. Place your answer in the space provided. At any time you may choose to skip to the next item by typing an "S" in the first space and hitting ENTER.

1. CCIEOAN Answer: 
2. EASDIES Answer: 
3. CNITKHE Answer: 
4. YALROVE Answer: 
5. SELSNOS Answer: 
6. KOOLOTU Answer: 
7. KARMSER Answer: 
8. STENPER Answer: 
9. TERALC Answer: 
10. SANRETL Answer: 
11. DREEUCS Answer: 
12. VERREES Answer: 
13. NOISTEC Answer: 
14. NUTSGOH Answer: 
15. NEECISL Answer: 
16. SRETSSI Answer: 
17. DROWREI Answer: 
18. RAETRNI Answer: 
19. AROTENS Answer: 
20. RERCMAH Answer: 
Appendix C

STATE-TRAIT ANXIETY INVENTORY – S-ANXIETY SCALE (FORM Y)

(Spielberger, 1983)

Instructions: A number of statements which people have used to describe themselves are given below. Read each statement and then select the appropriate response to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings at best.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Moderately so</th>
<th>Very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.* I feel calm.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I am tense.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3.* I feel at ease.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I feel frightened.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5.* I feel comfortable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I feel nervous.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. I am jittery.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8.* I am relaxed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9.* I feel content</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I am worried.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

* - Reverse score
Appendix D

TASK DIFFICULTY MANIPULATION

Instructions: The purpose of this experiment is to investigate styles in problem solving. You will be asked to solve a series of anagrams. Similar to the game of Scrabble, you will be given a set of letters and it will be your task to unscramble the letters in order to form a word.

All participants will be randomly assigned to solve SET A anagrams or SET B anagrams.

SET A: These anagrams consist of simple 4 letter sets.

Examples:

<table>
<thead>
<tr>
<th>Anagram</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCOL</td>
<td>COOL</td>
</tr>
<tr>
<td>ASFT</td>
<td>FAST</td>
</tr>
<tr>
<td>GINR</td>
<td>RING</td>
</tr>
</tbody>
</table>

SET B: These anagrams consist of more difficult 7 letter sets.

Examples:

<table>
<thead>
<tr>
<th>Anagram</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>DUBIERL</td>
<td>REBUILD</td>
</tr>
<tr>
<td>DASERTH</td>
<td>TRASHED</td>
</tr>
<tr>
<td>INERTAR</td>
<td>TERRAIN</td>
</tr>
</tbody>
</table>
Appendix E

ABSTRACT CONSTRUAL MANIPULATION

(Freitas, Gollwitzer, & Trope, 2004)

Survey Instructions

On the following pages, you will be prompted for answers that follow a similar framework as the illustration below.

1) Insert a response in the first box answering the question WHY you would maintain good physical health. 2) On the next page, insert a second response answering WHY you would engage in that new response. 3) On each page that follows, continue upwards (similar to the illustration below) by responding WHY you would engage in the answer from the previous page.

Maintain good physical health.
Appendix F

CONCRETE CONSTRUAL MANIPULATION

(Freitas, Gollwitzer, & Trope, 2004)

Survey Instructions

On the following pages, you will be prompted for answers that follow a similar framework as the illustration below.

1) Insert a response in the first box answering the question **HOW** you would maintain good physical health. 2) On the next page, insert a second response answering **HOW** you would engage in that new response. 3) On each page, continue downwards (similar to the diagram below) by responding **HOW** you would engage in the answer from the previous page.
Instructions: Please carefully read all sentence stems. Then complete the four sentence stems – and only those four – that match best how you think about the upcoming analogy task.

<table>
<thead>
<tr>
<th>Sentence stems suggesting the formulation of plans*</th>
<th>Sentence stems not suggesting the formulation of plans*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically, I will…</td>
<td>All in all, I will…</td>
</tr>
<tr>
<td>Until….I will…</td>
<td>In general, I will…</td>
</tr>
<tr>
<td>If…then I will…</td>
<td>In principle, I will…</td>
</tr>
<tr>
<td>I will not…but instead…</td>
<td>I will not…</td>
</tr>
</tbody>
</table>

*Sentence stems will be presented in random order
## Appendix H

**WORDS TO BE RECALLED IN THE WORKING MEMORY MEASURE**

*(La Pointe & Engle, 1999)*

<table>
<thead>
<tr>
<th>act*</th>
<th>dance</th>
<th>green</th>
<th>nose</th>
<th>talk</th>
</tr>
</thead>
<tbody>
<tr>
<td>arm</td>
<td>dust</td>
<td>guest</td>
<td>out</td>
<td>tool</td>
</tr>
<tr>
<td>beach</td>
<td>ear</td>
<td>heat</td>
<td>own</td>
<td>town</td>
</tr>
<tr>
<td>bird</td>
<td>east*</td>
<td>help</td>
<td>paint</td>
<td>truck</td>
</tr>
<tr>
<td>blue</td>
<td>fact</td>
<td>jump</td>
<td>rain*</td>
<td>wife</td>
</tr>
<tr>
<td>bomb</td>
<td>far</td>
<td>king</td>
<td>rock</td>
<td>wire</td>
</tr>
<tr>
<td>camp</td>
<td>five</td>
<td>lock</td>
<td>score</td>
<td></td>
</tr>
<tr>
<td>close</td>
<td>gas</td>
<td>moon</td>
<td>snake</td>
<td></td>
</tr>
</tbody>
</table>

*practice word