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Elizabeth Anna Guth

DePaul University, [elizabeth.a.guth@gmail.com](mailto:elizabeth.a.guth@gmail.com)

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Defensive Pessimism and Goal Setting

Elizabeth A. Guth

DePaul University

**Abstract**

Studies have found that the defensive pessimism cognitive strategy which involves going into situations with unrealistically low expectations despite previous high performance, leads to lower levels of performance when individuals taking on this strategy have expectations placed upon them in the form of encouragement (Norem & Cantor, 1986a, 1986b). Thus far, no one has applied goal setting theory to this phenomenon to try to investigate the possible interactive effects of goal setting and encouragement on performance (Locke & Latham, 2002). This study hypothesized that specific difficult goals would have negative effects on individuals more likely to take on a defensive pessimistic strategy, similar to the negative effects encouragement has on these individuals, while both specific difficult goals and encouragement would have positive effects for individuals more likely to take on an optimistic strategy (i.e., entering situations with high expectations of performance and high levels of previous performance). However, overall results of this study demonstrated that specific difficult goals had a positive impact for all individuals, regardless of where they fell on the optimism-defensive pessimism spectrum, with an exception to this positive effect when individuals who were more likely to take on a defensive pessimistic strategy also received encouragement. This suggests that the cognitive strategy that defensive pessimists use is interfered with when they are encouraged and assigned a specific difficult goal, which is the opposite of the effects that specific difficult goals and encouragement have on optimists.

## **Introduction**

Goal setting theory has been found to be one of the most effective theories of motivation for enhancing performance (Locke & Latham, 2002; Mento, Steel, & Karren, 1987; Tubbs, 1986). Goal setting has taken an integral role in the best practices for motivating a workforce, making it a useful theory to apply when attempting to boost performance (Carnevale, Gainer, & Meltzer, 1990). Research has indicated that the setting of specific and difficult goals tends to lead to higher performance compared to “do-your-best” conditions, but there is not research indicating if the goal-setting strategy proves to be effective when individuals take on a defensive pessimist strategy, which involves intentionally setting low expectations of themselves (Locke & Latham, 2002). Specifically, this defensive pessimistic strategy includes going into a situation with low expectations and using the fear of failure as motivation to work harder and perform well (Norem & Cantor, 1986a). This strategy is blocked when these individuals are told that it is expected that they will perform well, since these individuals use low expectations as a way manage their anxiety, and when this is interfered with, their anxiety becomes debilitating. However, this same encouragement given to optimists does not have the same negative effect (Norem & Cantor, 1986b). Goal setting literature suggests that the combination of goals and encouragement leads to higher performance than goals alone, but there is currently no research on whether this holds true for the defensive pessimist strategy (O’connor & Claridge, 1955). The present study will shed light on the different effects encouragement and goal setting have on optimists versus defensive pessimists.

## **Optimism and Pessimism**

The study of optimism and pessimism can be traced back to philosophers in the 17<sup>th</sup> century who attempted to categorize people according to personality qualities (Domino &

Conway, 2001). As the construct has evolved, two parties were formed: those who believe optimism and pessimism are dispositions (i.e., the generalized expectancy of good versus bad outcomes in life), and those who believe them to be explanatory styles (i.e., the ways in which individuals explain events that occur in their lives) (Scheier & Carver, 1985; Gillham, Shatte, Reivich, & Seligman, 2001). Despite these differing views, research from both camps lead to similar results, showing that optimism tends to lead to better psychological and physical health indices (Gillham et al., 2001).

Treating optimism and pessimism as traits, researchers have found test-retest correlations within individuals to be relatively high: up to .79 over a period of 28 months (Scheier, Carver, & Bridges, 1994). However, there tends to be variations in optimism and pessimism both situationally and over extended periods of time. For example, researchers have found that individuals shift from optimism strategies to pessimism strategies in certain situations, such as when feedback is anticipated in the near future, the outcome is important, negative outcomes are easily imagined, or outcomes are uncontrollable (Sweeny, Carroll, & Shepperd, 2006). It is also possible that this trait can change over long periods of time for some people, as individuals become more or less pessimistic or optimistic, especially in the event of resource and life circumstance changes (Seegerstrom, 2007).

There continues to be controversy over whether optimism should be considered a bipolar dimension or whether there are two separable dimensions, one pertaining to optimism and the other pertaining to pessimism (Carver, Scheier, & Seegerstrom, 2010). In conducting confirmatory and exploratory factor analyses, researchers have found support for the bi-dimensionality of optimism and pessimism when they are defined as positive and negative expectancies (Chang, D’Zurilla, & Maydeu-Olivares, 1994; Chang, Maydeu-Olivares, &

D’Zurilla, 1997; Herzberg, Glaesmer, & Hoyer, 2006). One popular method of measuring optimism and pessimism is to ask people whether they expect outcomes in their lives to be good or bad, which is the method developed in the Life Orientation Test- Revised (LOT-R) scale for measuring optimism (Scheier, Carver, & Bridges, 1994). The authors of this measure believe that optimism and pessimism are treated as a spectrum with very optimistic on one side and very pessimistic on the other; most people tend to fall somewhere in between (Carver et al., 2010). However, factor analyses on the internal structure of the LOT-R have found that dispositional optimism measured with this tool is bidimensional, consisting of an Optimism and a Pessimism factor which are relatively unrelated (Chang et al., 1994; Creed, Patton, & Bartrum, 2002; Herzberg et al., 2006). Researchers in defense of the LOT-R, argue that due to social desirability, deviation from unidimensionality of observed scores does not imply deviation from unidimensionality of optimism when method effects are incorporated in the model (Rauch, Schweizer, & Moosbrugger, 2007).

Other researchers have posited that while individuals may have a general trait or disposition, it could have many potential manifestations. Individuals may take on different cognitive strategies in different situations (Norem, 1989). Strategies may be developed in the context of particular goals, and whether or not an individual is aware of it, they may be using different cognitive strategies in various trials (Norem, 2001). Norem and Cantor (1986a) have grouped individuals into four separate groups based on these cognitive strategies: In the optimistic (or strategic optimist) strategy, individuals acknowledge generally positive past experiences and expect positive outcomes in the future. In the defensively pessimistic strategy, individuals recognize positive past experiences, but expectations for future outcomes are low. In the regular pessimistic strategy (also referred to as depressive pessimists or self-handicapping),

individuals view past experiences as negative and anticipate more negative outcomes in the future. Finally, in the unjustified optimistic strategy, individuals view past experiences as negative, but expectations for the future are positive.

### **Defensive Pessimism**

Research indicates that individuals using a defensive pessimism strategy set unrealistically low expectations of themselves, especially when facing risky situations, or those which represent the possibility of achieving success or satisfaction and the potential for failure and disappointment, which may have a negative impact on their self-confidence (Norem & Cantor, 1986b). Individuals who adopt a defensive pessimism strategy tend to have higher levels of anxiety compared to those who adopt optimism strategies (Norem & Cantor, 1986b). Defensive pessimists use their anxiety about fear of failure to motivate them to prepare better than they would otherwise, in order to avoid the failure (Norem & Cantor, 1986a). Research has shown that when individuals perform at levels higher than expected, they experience more positive affect than when they expect those high levels of performance (Feather, 1969). Similarly, when they experience unexpected failure, they are more dissatisfied than when such failure is expected (Feather, 1969). This helps explain why the defensive pessimism strategy may be useful to some individuals. Therefore, the primary purpose of the defensive pessimism construction of a situation for the individual is managing anxiety and fear of failure through low expectations (Norem & Cantor, 1986b).

Research has shown that defensive pessimism is in fact different from both optimism or other types of pessimism. Researchers found that when individuals with optimistic strategies (expecting high performance levels) were given failure feedback, they denied having control over their performance, though they took credit for their positive performance. This contrasted

with defensive pessimists who did not deny control over performance when they received failure feedback, likely because they were expecting the failure, and had braced themselves for it.

Defensive pessimists differ from other pessimists in that they are just as happy with their successes as optimists, whereas other pessimists tend not to feel satisfied with positive performance (Norem & Cantor, 1986a; Kuiper, 1978).

### **Encouragement**

One way researchers have tested the idea of defensive pessimism as a cognitive strategy is by using interference. Specifically, when an individual uses a defensive pessimism strategy, they are setting low expectations of themselves, which is interfered with when they are told that they should expect to do well (Norem & Cantor, 1986b). This encouragement, in the form of high external expectations, disrupts the defensive pessimist's strategy of going into situations with low expectations by making salient the discrepancy between the individual's high past performance and the unrealistically low expectations they set for themselves, interfering with the defensive pessimism strategy of decreasing anxiety with low expectations and they perform poorly compared to when they are not given this encouragement (Norem & Cantor, 1986b). As a result, the encouraged defensive pessimist is left feeling anxious and psychologically unprepared in the event of poor performance, and they end up perform poorly compared to when they did not receive this encouragement (Norem & Cantor, 1986b). When the defensive pessimism strategy is blocked and there is poor performance, these individuals resort to post-hoc protective strategies comparable to those used by optimists, such as denying control over failure (Norem & Cantor, 1986b).

Defensive pessimists take on a task-focused strategy of thinking about all possible outcomes and reflecting on the upcoming task, whereas optimists take on a self-focused strategy



of avoiding reflectivity of the task and feeling calm. When the optimists and defensive pessimists had to trade strategies, they performed significantly worse. Specifically, when individuals taking on a defensive pessimism strategy were prevented from reflecting prior to their performance or were placed in a relaxation condition (strategies helpful to optimists), they were significantly more anxious and performed significantly more poorly. When optimists had to reflect about the upcoming task and imagine correcting mistakes (a defensive pessimism strategy), they were significantly more anxious and performed significantly more poorly (Norem, 2001; Norem & Illingworth, 1993; Spencer & Norem, 1996). Adding support to these cognitive strategies, researchers have found that strategic optimists perform the best when they are in a positive mood induction condition, as it is congruent with their cognitive strategy (Norem & Illingworth, 2004). Conversely, individuals using a defensive pessimism strategy perform the best when they receive a negative mood induction, and perform the worst when they are in a positive mood induction condition (Norem & Illingworth, 2004). Researchers have suggested that this occurs because positive thinking serves as a cue for individuals to stop preparation for that specific task, which contradicts the defensive pessimism strategy (Norem, 2001; Martin, Ward, Achee, & Wyer, 1993).

Therefore, the high levels of anxiety experienced by defensive pessimists do not hinder performance because these individuals are able to use it to their advantage. They do this by both preparing more for the task at hand and bracing themselves for potential failure, to alleviate their fear of this failure. If a defensive pessimist experiences interference when constructing an upcoming situation, they are less prepared for negative consequences. This means they will continue to have high levels of anxiety, which in turn impair performance (Norem & Cantor, 1986b).

### **Goal Setting Theory**

Goal setting theory posits that assigning specific difficult goals leads to higher levels of performance compared to assigning do-your-best goals (Locke & Latham, 2002). Research has shown that the most effective goals are those that are specific and difficult, so long as the individual is committed to the goal, has the necessary abilities to attain it, and does not have conflicting goals (Locke & Latham, 2002). Goal setting research suggests that encouragement in the form of others expressing their confidence in individuals, in conjunction with skill development, may help individuals overcome fear of failure and increase goal commitment, which in turn leads to higher levels of performance (Locke, 1980). Additionally, the combination of the setting of specific and difficult goals with high goal commitment, leads to higher levels of performance (Locke & Latham, 1990, 2002). However, goal commitment is facilitated by importance of goal attainment and self-efficacy, or the belief that the individual can attain the goal (Klein, Wesson, Hollenbeck, & Alge, 1999; Seijts & Latham, 2000). No research has been done to investigate whether the same effects hold true for individuals utilizing a defensive pessimism strategy, which is significant because this strategy involves intentionally setting low expectations, a contradiction to goal setting theory. If the effect of goals and expectations on performance are different for defensive pessimists and optimists, this could have implications for how leaders go about motivating employees to perform well, which may differ depending on the employee's cognitive strategy.

One of the primary reasons the setting of goals leads to higher performance levels is because goals direct attention and action (Locke & Latham, 1990). However, the defensive pessimism strategy involves setting unrealistically low goals for oneself. They use this as a way to alleviate performance anxiety. These individuals use their fear of failure as motivation to exert

more effort in preparation in order to perform at a higher level (Norem & Cantor, 1986a).

Researchers have found that fear of failure was a positive predictor of defensive pessimism, and defensive pessimists adopt both approach- and avoidance-focused performance goals (Elliot & Church, 2003). Additionally, compared to optimists, defensive pessimists showed significantly lower mastery goals (Yamawaki, Tschanz, & Feick, 2004). Researchers have found that students who use both task and self-defeating goals are more likely to utilize a defensive pessimism strategy than those who create solely task-oriented goals (Suárez Riveiro, Cabanach, & Arias, 2001). These studies show that the goals defensive pessimists set for themselves are more of an attempt to avoid failure than to aim for successes.

The defensive pessimism strategy involves enter situations with low expectations about how well the individual believes they will perform, but it is not yet known if assigning specific difficult goals will have the same negative effect on performance that encouragement does. Combining goal setting theory and encouragement will provide greater insight into the cushioning strategies used by defensive pessimists. Encouragement from others disrupts the defensive pessimism strategy of going into situations with low expectations and using anxiety about failure as motivation to work harder (Norem & Cantor, 1986a, 1986b). It is possible that the setting of specific difficult goals may work in a similar manner, hindering the performance level of these individuals.

### **Goal Commitment**

The relationship between goals and performance is the strongest when individuals are committed to their goals (Locke & Latham, 2002). Goal commitment is one of the most important factors for success when goals are difficult (Klein et al., 1999). Goal commitment is facilitated by both the belief that the goal is important and an individual's self-efficacy related to

achieving the goal (Locke & Latham, 2002). Meta-analytic results have shown that when individuals have a voice in determining the goal, they tend to have higher levels of commitment (Klein et al., 1999). However, assigned goals are just as effective as those set with the input of the individual being given the goal, so long as this individual is given the purpose or rationale for the goal (Locke, Latham, & Erez, 1988). Though individuals utilizing a defensive pessimism strategy demonstrate high levels of goal commitment by focusing their mental resources on the task at hand, they likely would not acknowledge it in a self-reported measure of goal commitment, as they use lack of goal commitment as a cushioning strategy in the event of failure.

### **Self-Efficacy**

Self-efficacy is defined as an individual's belief that they can attain a goal (Bandura, 1986; Locke & Latham, 2002). With this definition, it would appear that defensive pessimists have lower levels of self-efficacy, as they approach situations genuinely believing they will not succeed. Typically, when goals are assigned, individuals with high self-efficacy have higher commitment to their goals, which leads to higher levels of performance, than those with lower self-efficacy (Bandura, 1977; Locke & Latham, 2002). Bandura's social cognitive theory states that people use goals to gain self-efficacy, and goal success is more likely to enhance self-efficacy if performances are perceived as resulting from skill (Bandura, 1977; Wood & Bandura, 1989). Individuals utilizing a defensive pessimism strategy would acknowledge their previous successes, but may not let it increase their self-efficacy on subsequent tasks, which contradicts with this theory. This could be due to the fact that these individuals tend to not feel satisfied with their past successes, so they may not let it impact their self-efficacy (Cantor, Norem, Niedenthal, Langston, & Brower, 1987; Norem & Cantor, 1986a, 1986b; Norem & Illingworth, 1993). Since

self-efficacy is a result of performance (and not the other way around), it is possible for defensive pessimists to continue to have high levels of performance despite having low levels of self-efficacy (Sitzmann & Yeo, 2013).

### **The Contradiction Between Defensive Pessimism and Goal Setting Theory**

Previous studies have found that individuals who took on a defensive pessimism strategy did not differ in actual performance levels from individuals who utilized an optimism strategy when controlling for GPA and past successes, and even acknowledged their past successes, but continued to set low expectations for future performance as a cushioning strategy to reduce the fear of failure (Norem & Cantor, 1986a). This contradicts with goal setting theory and Bandura's social cognitive theory, as they state that individuals who are committed to specific, difficult goals, and have high levels of self-efficacy regarding achieving that goal, outperform those who do not (Bandura, 1986; Locke, 1980; Locke & Latham, 2002). Research on goal orientation discusses a performance-avoid goal orientation, in which individuals attempt to avoid disproving their competence, which appears to be in line with the defensive pessimism strategy, as these individuals attempt to avoid failure. In examining correlations with proximal consequences, the performance-avoid goal orientation was found to be negatively correlated with task-specific self-efficacy, and positively correlated with state anxiety (Cellar et al., 2011; Payne, Youngcourt, & Beaubien, 2007). This holds true for defensive pessimists, as these individuals do not expect that they will be able to perform well on the task, and have higher levels of anxiety (Norem & Cantor, 1986a). Researchers also found that distal consequences of performance-avoid goal orientation included poor task, academic, and job performance (Payne et al., 2007).

Researchers did find that over time, defensive pessimists experienced more perceived life stress, more psychological symptoms of worry, sleeplessness, and hopelessness, were less

satisfied with their lives, and earned lower grade point averages (GPAs) than optimists (Cantor & Norem, 1989). This partially explains the contradiction between goal setting research and defensive pessimism, as both bodies of research show that individuals who go into situations with the objective of avoiding failure are likely to perform more poorly over time than those who take on other goal orientations.

The idea that individuals utilizing a defensive pessimism strategy may perform well on individual trials despite low levels of self-efficacy conflicts with social cognitive theory, which proposes that an individual's self-efficacy beliefs will determine their level of motivation, in that the more they believe in their capabilities, the greater and more persistent their efforts would be (Bandura, 1988, 1989). Other researchers have proposed that when studies on self-efficacy are conducted within-subjects and over time (instead of between-subjects), self-efficacy may actually lead to overconfidence, resulting in complacency with their abilities and the idea they do not need to increase effort, which ultimately results in poor performance (Vancouver, Thompson, Tischner, & Putka, 2002). Individuals with low self-efficacy then, expend more effort trying to achieve the goal, which leads to higher levels of performance (given an acceptance of cognitive participation/the difficult goal itself) (Vancouver, Thompson, & Williams, 2001). This aligns with the defensive pessimism strategy, as these individuals believe they are going to perform poorly so they work hard to avoid this failure. Even still, self-efficacy was found to be a result of past performance, meaning that if individuals did well on previous trials, they would have higher levels of self-efficacy for subsequent trials (Vancouver et al., 2001). This conflicts with the defensive pessimism strategy, as these individual utilizing this strategy do acknowledge their previous successes but do not let it influence their levels of self-efficacy for future performance (Norem & Cantor, 1986b).

**Affect**

Positive and negative affect have been found to be separate, independent constructs. Positive affect refers to the extent to which an individual feels enthusiastic and alert versus sad and lethargic. Negative affect reflects a general dimension of subjective stress, with higher negative affect representing contempt, fear, and nervousness, and lower negative affect representing a state of calmness (Watson, Clark, & Tellegen, 1988a). Previous studies have found that individuals utilizing a defensive pessimism strategy report states more in line with negative affect and less in line with positive affect than strategic optimists (Norem & Illingworth, 1993; Norem, 2001).

**Summary**

Goal setting and self-efficacy literature predicts that an individual who takes on a defensive pessimistic strategy would perform at lower levels on a specific task than an individual who takes on an optimistic strategy would, yet research has found that it not the case. One possibility is that individuals who take on a defensive pessimism strategy are those who are naturally more anxious, and by imagining the worst-case scenario before performing a task, they are able to view the actual performance as less onerous, and perform at the same levels as someone who did not have the anxiety in the first place. It is important to study whether specific difficult goals like those used in goal setting literature have the same negative influence that encouragement in the form of expectations has had on defensive pessimists in previous research, to examine if there really is a stark contradiction between goal setting theory and the defensive pessimism strategy. Specific measures of self-efficacy will also help investigate whether defensive pessimism contradicts social cognitive theory.

Two forms of hierarchical regression modeling were utilized to assess performance: one which included positive affect, negative affect, goal commitment, and self-efficacy as control variables starting from the beginning, as these variables are known to mediate the relationship between goals and performance. Models 2-4 would incorporate the main effects of the primary independent variables (goal condition, encouragement condition, and optimism-defensive pessimism), the two-way interactions between the primary independent variables, and the three-way interactions between the primary independent variables. The second form of hierarchical regression modeling would assess performance by including the control variables last in order to view the total effects of the primary independent variables. In this method, Model 1 would consist of the primary independent variables (goal condition, encouragement condition, and optimism-defensive pessimism), Models 2 and 3 would incorporate the two- and three-way interactions, and Model 4 would add in the control variables. Thus, Model 4 would be the same in both methods, representing the theory of motivation for this study. Additional simple hierarchical regression analyses would be used with positive affect, negative affect, goal commitment, and self-efficacy as the primary dependent variables.

It is predicted that individuals who are more likely to utilize an optimistic strategy will be reinforced by the same encouragement, with respect to subsequent performance. It is predicted that for individuals who are more likely to utilize a defensive pessimistic strategy, the presence of encouragement will lead to lower levels of performance than when they are not encouraged. For individuals who are more optimistic, the presence of encouragement will lead to higher levels of performance than when there is no encouragement, as this is interpreted as reinforcement. Additionally, for individuals who are more likely to take on a defensive pessimist strategy, the assignment of difficult goals will lead to lower levels of performance than the



absence of specific difficult goals. The setting of specific difficult goals will increase performance levels of optimists. Different effects are predicted for individuals more likely to take on an optimistic versus defensive pessimistic strategy when presented with goals and encouragement. Both encouragement and goal assignment will decrease performance of defensive pessimists, while this combination of goal setting and encouragement will lead to high levels of performance for individuals more likely to take on an optimistic strategy.

Since interference of the defensive pessimism strategy can come in the form of encouragement from others- the same encouragement which serves as reinforcement for optimists- this poses potential problems for leaders in the workplace (Norem & Cantor, 1986b). Managers are given the task of encouraging employees to enhance performance, which may be bad for an employee with a defensive pessimism strategy, as it could hinder their performance (Berlew & Hall, 1966).

### **Pilot study**

To ensure specific assigned goals are difficult, a Pilot study was conducted on Amazon's Mechanical Turk (MTurk) to determine the level of difficulty that should be assigned to MTurk workers. Twenty MTurk workers were recruited to participate in the pilot study on creative use generation, and after reporting their demographics, were given two minutes to come up with as many novel uses as possible for a brick. After this task, they were given two minutes to come up with as many novel uses as possible for a wire clothes hanger. Afterwards they were thanked for their participation, and paid \$0.30 for their involvement. From this, the 90<sup>th</sup> percentile of the number of creative uses was calculated and that number will be assigned as the difficult goal for creative use generation. Results of this pilot study indicated that the assigned difficult goal for the study should be for participants to generate 12 novel uses for the common object.

## **Hypotheses**

The first hypothesis deals with the different effects that assigned difficult goals and encouragement will have on individuals depending on the likelihood they take on an optimistic versus a defensive pessimistic, in that encouragement and specific difficult goals will have a positive influence on performance for individuals who are more likely to utilize an optimistic strategy and a negative influence on performance for individuals who are more likely to utilize a defensive pessimistic strategy. This first hypothesis is supported by goal setting literature for individuals who are more likely to utilize an optimistic strategy, and contradicts goal setting literature for individuals who are more likely to utilize a defensive pessimistic strategy, as goal setting literature posits that specific difficult goals lead to higher performance (Locke & Latham, 2002; Locke, Shaw, Saari, & Latham, 1981). This hypothesis is supported by defensive pessimism research which suggests that individuals utilizing a defensive pessimism strategy set lower goals for themselves and that encouragement from others interferes with their cognitive strategy and leads to lower levels of performance than when there is no encouragement given, while the same encouragement is seen as reinforcement for the optimist strategy which increases their performance levels (Norem & Cantor, 1986b).

Hypothesis 1: There will be a three-way interaction and simple effects between goal condition, encouragement condition, and optimism-defensive pessimism such that the presence of assigned difficult goals and encouragement will enhance the performance for individuals more likely to utilize an optimistic strategy, but hinder the performance for individuals more likely to utilize a defensive pessimist strategy.

The following hypotheses relate to how individuals who are more optimistic will view specific difficult goals and encouragement in a positive manner, while individuals who are more

defensively pessimistic experience more negative affect when they are presented with encouragement and specific difficult goals. Separate hypotheses were made for positive and negative affect since the two have been determined to be independent constructs. Positive affect reflects the extent to which a person feels enthusiastic and alert, with the opposite end being characterized by sadness and lethargy. Negative affect is a general dimension of subjective distress, characterized by emotions including contempt, fear, and nervousness, with low negative affectivity reflecting a state of calmness (Watson et al., 1988a).

Hypothesis 2: There will be a three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism such that the effect of specific difficult goals and encouragement on positive affect for individuals who are more likely to utilize an optimistic strategy will be positive, while the effect of specific difficult goals and encouragement on positive affect for individuals who are more likely to utilize a defensive pessimistic strategy will be negative.

Hypothesis 3: There will be a three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism such that the effect of specific difficult goals and encouragement on negative affect for individuals who are more optimistic will be negative, while the effect of specific difficult goals and encouragement on negative affect for individuals who are more defensively pessimistic will be positive.

Meta-analytic results have shown that when individuals have a voice in determining the goal, they tend to have higher levels of commitment (Klein et al., 1999). Additionally, these researchers found that the relationship between commitment and performance is stronger for difficult relative to easy goals (Klein et al., 1999). Individuals utilizing a defensive pessimist strategy demonstrate high levels of goal commitment by focusing their mental resources on the

task at hand, though they likely will not acknowledge it in a self-reported measure of goal commitment, as they use lack of goal commitment as a cushioning strategy in the event of failure.

Hypothesis 4a: Individuals in the do-your-best condition will have higher levels of goal commitment than those in the specific difficult goal condition.

Hypothesis 4b: There will be an interaction between goal commitment and goal type (specific difficult, vs. do-your-best) on performance, in that effect of having high goal commitment on performance would be greater for individuals who were in the specific difficult goal condition therefore leading to higher levels of performance than individuals for these individuals, than those who were in the do-your-best goal condition with similar levels of goal commitment.

Hypothesis 4c: Individuals who are more defensively pessimistic will exhibit lower levels of goal commitment than individuals who are more optimistic.

Self-efficacy is one's belief in their ability to successfully achieve a goal (Bandura, 1986). Individuals using a defensive pessimism strategy intentionally go into situations expecting low levels of performance (Norem & Cantor, 1986a). It is therefore expected that individuals higher in defensive pessimism will have lower levels of self-efficacy than individuals higher in optimism, and the effect will be stronger when encouragement and goal assignments are implemented.

Hypothesis 5a: Individuals higher in defensive pessimism will have lower levels of self-efficacy than individuals higher in optimism.

Hypothesis 5b: There will be a three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism, such that the presence of specific

difficult goals and encouragement on self-efficacy for individuals who are more optimistic will be positive, while the presence of specific difficult goals and encouragement on self-efficacy for individuals who are more defensively pessimistic will be negative.

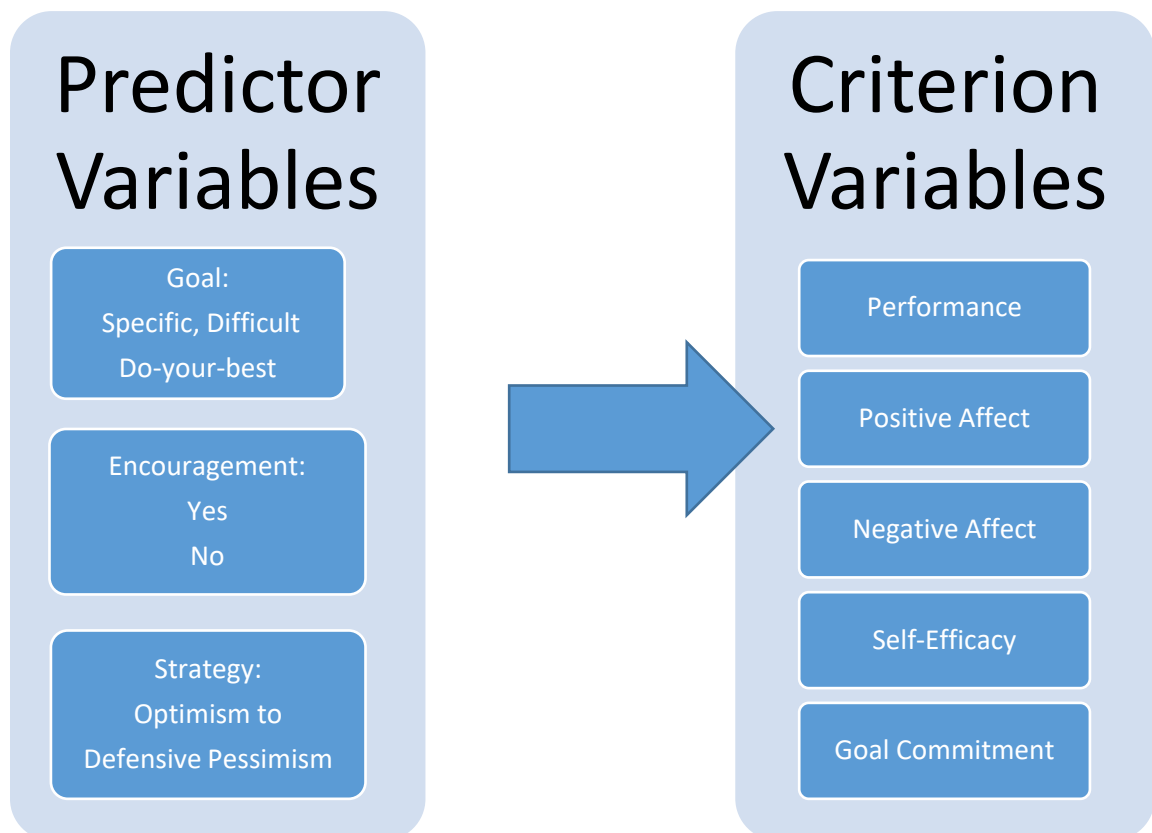
Researchers have found that scores on cognitive ability tests are subject to the practice effect, and improve over time (Hausknecht, Halpert, Di Paolo, & Moriarty Gerrard, 2007). Beyond this, it is possible that defensive pessimists will adjust the imposition of goals and encouragement, and perform at higher levels of subsequent levels.

Hypothesis 6: Over several trials, defensive pessimists will adjust to the manipulations of goal assignment and encouragement, and will perform at higher levels.

Figure 1 shows all the predictor and criterion variables.

Figure 1

*Variables in the Study*



## Method

### Participants

Participants were recruited online using Amazon's Mechanical Turk (MTurk), which is a crowdsourcing tool allowing for the anonymous task participation of subjects online, in exchange for compensation. Studies have shown that the subject pool available on MTurk is more representative of the United States population than university subject pools, which allows for better generalizability of results, and also that the data collected through MTurk is at least of equal quality to data collected through university subject pools (Paolacci, Chandler, & Ipeirotis, 2010; Mason & Suri, 2012). Some have argued that with the lack of supervision, participants may not pay attention leading them to not be properly affected by the manipulation (Oppenheimer, Meyvis, & Davidenko, 2009). However, the inclusion of Instructional manipulation checks (ICMs) has been shown to increase statistical power and reliability of a dataset in these circumstances (Oppenheimer et al., 2009). Additionally, studies have found that data collected on MTurk may have higher internal validity than those collected through more traditional methods as a result of the lack of experimenter bias and other confounding factors MTurk prevents, such as the lack of non-response error (Paolacci et al., 2010).

With a power of .8 and a medium effect size, this study requires a sample size of at least 196, or 49 subjects in each group, so 250 subjects were recruited from MTurk to account for incomplete data, those who failed attention checks, and those who did not qualify likely to take on either an optimism or defensive pessimism strategy (explained in greater detail below) (Faul, Erdfelder, Buchner, & Lang, 2009). The study randomly assigned participants and manipulated both whether participants were assigned a specific difficult goal on a creative generation task or

given a do-your-best goal, as well as whether they received encouragement or did not receive encouragement. MTurk workers were paid \$0.50 for their participation in the study.

In total, 347 individuals participated in the study. However, after removing data from participants who did not pass attention checks, did not follow instructions, or did not fall on the optimism-defensive pessimism spectrum, data for 256 participants were usable and analyzed.

Optimism-defensive pessimism scores were calculated for participants who rated a “4, neutral” or above on the question “I generally go into creative task situations with positive expectations of how I will do”, as these individuals may be take on either a defensive pessimist or an optimist strategy, as they acknowledge positive past performance. Potential scores could range from -24 (all defensive pessimist responses) to +24 (all optimist responses). Scores in the data ranged from -18 to +21. This score indicates the likelihood the individual would take on a defensive pessimistic strategy versus an optimistic one.

### **Task**

A creative generation task was used in which participants were asked to generate as many novel uses for a common item as possible, which is a validated psychometric measurement of creativity, and creativity is shown to be an important component of problem-solving and other cognitive abilities (J. Plucker & Renzulli, 1999; J. A. Plucker, Beghetto, & Dow, 2004). The assigned difficult goal was to generate 12 novel uses, which was a the 90<sup>th</sup> percentile in the results from the pilot study conducted on MTurk as this was the population used in the experiment itself. This aligns with previous studies in which the difficult goal consisted of giving 12 uses for the item, which was an expected success rate of 10%, based on goal setting literature in the university environment (Locke & Latham, 1990; Stajkovic, Locke, & Blair, 2006; Locke, Frederick, Lee, & Bobko, 1984).

## Design & Manipulations

The study design was a multiple linear regression analysis with predictors including goal: specific difficult, do-your-best goal, encouragement: yes, no, and strategy as a continuous variable ranging from defensive pessimism to optimism, with performance on a creative generation task as the primary dependent variable.

**Strategy.** The participants in the study completed a revised version of the Defensive Pessimism Questionnaire (Norem & Cantor, 1986a), as it integrates aspects of the Optimism-Pessimism Prescreening Questionnaire and the Revised Defensive-Pessimism Questionnaire (Norem, 2001). The revised version used in this study is in Appendix A. Participants rated the degree to which they agreed with the statements on a 7-point scale ranging from 1 (Not at all true of me) to 7 (Very true of me). Item number three of the questionnaire differentiates strategic optimists and defensive pessimists from other types of optimists and pessimists. As such, participants who rated item number 3 (I've generally done pretty well in creative task situations in the past) below a 4 (neutral) on the scale were not considered likely to utilize an optimistic or a defensive pessimistic strategy, as this item indicates those who specifically acknowledge a high past base rate, which is requisite for these strategies (Norem & Cantor, 1986a). Individuals who rate below a 4 on this item reflect perceptions of average to low base rates of past performance on creative tasks, which is not reflective of either optimistic or defensive pessimistic behavior. In college student samples, typically fewer than 20% of respondents rated themselves below a 4 on this dimension (Norem, 2001). An optimism-defensive pessimism score was then computed for each participant by subtracting the sum of their endorsements for the four pessimistic items from the sum of their endorsements of the four optimistic items. Each participant then had an optimism-defensive pessimism score. This score was represented as the follows: as an individual



moves toward the defensive pessimism end of the scale, the likelihood of that individual utilizing a defensive pessimistic strategy is greater. As an individual moves toward the optimistic end of the scale, the likelihood of that individual utilizing an optimistic strategy is greater. As individuals score in the middle of the scale, we are less confident about the likelihood of that individual utilizing one cognitive strategy over the other.

**Goals.** Goal condition was the first assigned independent variable. Individuals were put into one of two conditions: specific difficult, or do-your-best. A specific difficult goal in this experiment was generating at least 12 creative uses for a common item. The other condition was do-your-best instructions, in which the instructions simply told participants to do their best on the task (see Appendix F for exact instructions).

**Encouragement.** The second assigned independent variable in this study is the presence of encouragement. Encouragement in this study was in the form of a final encouraging statement before the subjects began the second round of the task. Regardless of their actual performance, the study read: “Based on your previous performance during the practice round, you are expected to do VERY WELL during the task. You should feel very confident about your performance on this task since you scored very high compared to others who have performed the task. You should have no problem [achieving your goal (specific difficult goal condition)] performing well (do-your-best goal condition)”. In the no encouragement condition, participants did not receive any feedback regarding previous performance or expectations for future performance

### **Dependent Variables**

**Manipulation Checks.** In order to ensure the manipulations worked, there were manipulation checks in place.

To ensure that participants who were given a difficult goal recognized it as such, all participants filled out the goal difficulty questionnaire (See Appendix B). Participants rated the extent to which they agree with statements relating to the difficulty level at which they viewed their goal on a scale from 1 (Not at all true) to 7 (Very true).

To ensure participants felt the effect of encouragement, participants reported the extent to which they felt the expectations of them are high, using the expectation questionnaire and a scale ranging from 1 (Not at all true) to 7 (Very true) (See Appendix B).

**Performance.** Participants were evaluated based on their performance on the second round of the creative generation task. Participants were also evaluated based on overall performance, which was the sum of the performance scores on all five trials. Performance was indicated by the number of listed uses (excluding repetitions and things written that are not considered a “use”).

**Positive and Negative Affect.** Positive and negative affect were measured using the Positive and Negative Affect Scale (PANAS) (See Appendix E) (Watson et al., 1988a). Participants indicated the extent to which they currently felt various feelings on a 5-point Likert scale. Items indicating positive affect were summed for the positive affect score (items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19). Scores for positive affect will range from 10, indicating low positive affect, to 50, indicating high positive affect. Items indicating negative affect were summed for the negative affect score (items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20). Scores for negative affect will range from 10, indicating low negative affect, to 50, indicating high positive affect.

**Self-Efficacy.** Self-reported self-efficacy was scored using the certainty scale of the self-efficacy measure (Locke et al., 1984). Participants gave a percentage from 0-100% indicating their confidence in being able to generate varying numbers of items in 2 minutes, with 0%

indicating no confidence and 100% indicating complete confidence. These percentages were summed to indicate the total self-efficacy of individuals on the task. (See Appendix C) (Locke et al., 1984).

**Goal Commitment.** Goal commitment was measured using a four-item unidimensional self-report questionnaire (See Appendix D) (Hollenbeck, Klein, O’Leary, & Wright, 1989). Participants indicated the extent to which they agree on the four items on a 5-point Likert scale. Items were reverse-coded so that a high score represents stronger goal commitment, and a low score represents lower goal commitment. The scores were summed and an average was taken so that all scores will be from 1 (lowest level of goal commitment) to 5 (highest level of goal commitment).

### **Procedure**

Participants were shown the consent form and checked the box saying they had read and agree to the terms before continuing with the experiment. Participants were informed that they would be paid \$0.50 as it was expected to take them 10-15 minutes to complete. They were able to see the amount of pay before clicking on the study as well.

Participants completed six trials of the creative-uses task, the first presented as a practice trial to realize that the goal will be difficult to attain, and five target trials, each two minutes long. The conditions were issued during the target trial, at which point participants were familiar with the creative generation task and already have knowledge about how well they are able to perform on such a task. The practice trial also provided the opportunity to use this practice session as a covariate for analyses. Participants had the experimental task of creative generation described, explaining that they are to come up with as many novel uses for a common item as possible, no matter how unconventional.

Participants filled out demographic information, such as gender, age, ethnicity, occupation, and years of education. They then completed the Revised version of the Defensive Pessimism Prescreening Questionnaire. Before the practice round began, participants completed an Instructional Manipulation Check to ensure they were reading instructions clearly, as these have been shown to increase statistical power and reliability of a dataset in online studies (Oppenheimer et al., 2009).

Participants were informed that they were about to begin the practice round, and they would have two minutes to complete the task before the page would move forward automatically. The instructions explained that participants were to creatively generate as many uses for a brick as possible in two minutes.

After the two minutes, the page automatically moved on and participants were told that the computer was calculating the score based off the number of uses generated. They were then told that they are above average for creativity. Participants read the instructions about the next task, which explained that it is the same task but with a different item. The goal assignment was given (“Your goal is to generate at least 12 uses” or “Do your best”), depending on the randomly assigned condition. On the next page, the encouragement condition was given (“Your previous performance level was high, you should have no problem attaining your goal”). Participants in the no encouragement condition simply moved on to the next part of the study after the goal condition page.

Participants then reported their positive and negative affect using the PANAS, their self-efficacy using the Self-Efficacy Scale, and goal commitment using the Goal Commitment Scale (Watson et al., 1988a; Locke et al., 1984; Hollenbeck et al., 1989).

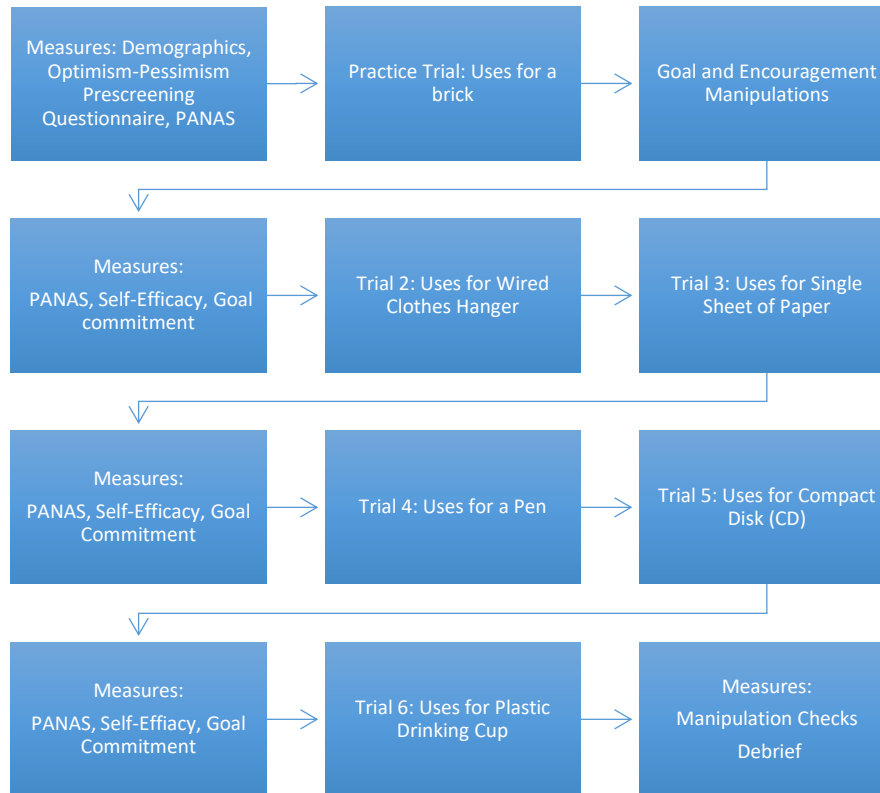
When participants were ready, they clicked to go on to the next page which was again timed to move on after two minutes, and their goal was in bold on top of the page, with a repeat of the encouragement if they are in the encouragement condition. Participants were asked to generate as many novel uses as possible for a wired clothes hanger. This page also had reminders of the conditions (See Appendix F). The page moved forward automatically after two minutes.

Participants then repeated the same task with differing creative generation objects a total of six times, including the practice trial. The objects in trials 1-6 were a brick, a wire clothes hanger, a sheet of paper, a pen, a CD, and a plastic drinking cup, in that order. Participants reported their positive and negative affect using the PANAS, their self-efficacy using the Self-Efficacy Scale, and goal commitment using the Goal Commitment Scale (Watson et al., 1988a; Locke et al., 1984; Hollenbeck et al., 1989) before the second, fourth, and sixth trials.

After two minutes for each trial, participants were directed to the next page in which they filled out the manipulation checks.

Participants were then debriefed as to the purpose of the prescreening and the study, and asked for any comments or questions. They were then thanked for their participation, and paid after completing the survey. In order to receive payment, participants were given a unique code (A generation of 7 random digits), which they entered on the home screen of the study. This was used to cross-check workers who completed the study. The primary researcher went through the results to ensure answers were of good quality (eliminating participants who wrote the same thing repeatedly or those who did not take the task seriously). If the participants also passed the manipulation checks and filled out the survey completely, the payment (\$0.50) was transferred to their MTurk account. Figure 2 shows a flow chart for the experimental procedures. Appendix F contains the scripts presented to the participants in each of the four conditions.

Figure 2

*Experimental Procedures***Results****Initial Analyses**

Performance scores were calculated by summing the creative uses participants generated for the different common objects for each trial. Items were eliminated if they were duplicates or not considered a “use” defined as unique ideas for the item. The manipulation checks were evaluated to ensure participants in the goal condition indicated that they had an assigned difficult goal, and those in the encouragement condition indicated that they felt like they had expectations imposed upon them. The participants who were told to do their best ( $M = 4.35$ ,  $SD = 1.46$ ) rated their perceived goal difficulty level significantly lower than individuals who were in the difficult

goal condition ( $M = 5.18$ ,  $SD = 1.30$ ;  $t(254) = -4.81$ ,  $p < .001$ ), demonstrating that the goal manipulation worked. Participants who received encouragement ( $M = 4.60$ ,  $SD = 1.39$ ) did not rate that they perceived to have more expectations imposed upon them than individuals who did not receive encouragement ( $M = 4.75$ ,  $SD = 1.31$ ;  $t(254) = 0.90$ ,  $p = .37$ ), suggesting that either the manipulation did not work or individuals did not recognize the effects of the manipulation. The reliability for the encouragement manipulation check was 0.74 suggesting that the items were moderately related to one another, which indicates that the measurement itself was not ideal.

Comparisons of initial performance scores yielded null effects for both the goal condition ( $t(254) = 0.12$ ,  $p = 0.90$ ) and the encouragement condition ( $t(254) = -0.25$ ,  $p = 0.80$ ), suggesting pre-test equivalence. The correlation between optimism-defensive pessimism and initial performance scores was .065, suggesting they were not strongly related to one another. Participants completed a practice round of the creative generation task, before they were assigned to any condition, which can be considered a pre-test. Pre-test scores for all the subgroups were compared. Table 1 shows the means, standard deviations, and size for all the conditions.

Table 1

*Pre-test Descriptive Statistics*

	Goal Condition			
	Do-your-best		Specific Difficult	
Encouragement	Mean (SD)	# Participants	Mean (SD)	# Participants
No	5.74 (2.83)	72	5.97 (2.88)	59
Yes	6.11 (2.95)	61	5.77 (3.71)	64

*Note.* *SD* represents the standard deviation for the group.

*# Participants* represents the number of participants in the group.

The means and standard deviations for all the dependent variables in the study, as well as optimism-defensive pessimism, and the correlations between all the variables is presented in Table 2. Optimism-defensive pessimism had a moderate Cronbach's alpha of .645, demonstrating that the construct has relatively high internal validity. Performance trials were moderately to highly correlated to one another, with the lowest correlations shown between Time 1 and Time 4 of 0.656, which was still statistically significant at the .01 level. The performance scores were all highly correlated with the sum of the performance scores. Positive affect across the four measurement times were found to be highly correlated, and the internal consistency scores for each scale including the coefficient alpha for the average positive affect were all very high. Negative affect followed the same patterns, exhibiting high correlation across the four time trials and high internal consistency for each of the trials as well as for the average negative affect score. Self-efficacy correlations ranged from .788 between Time 1 and Time 3, to .899 between Time 2 and Time 3, with high correlations between each of the times and the average, and coefficient alpha levels. Goal commitment scores across the three measurement times were all highly correlated with statistical significance at the .01 level, and had high internal consistency scores as well. The high coefficient alpha levels within each scale justify the combination of scales as they are all highly reliable.

### **Performance**

In order to test the hypothesis related to task performance, overall performance scores were calculated by summing the performance scores on the five creative task trials. Table 3 shows the means and standard deviations across the groups on performance. Results were analyzed using hierarchical regression analyses with summed performance as the dependent variable, with the independent variables as goal condition (do-your-best, specific difficult),



Table 2  
Correlations between Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1. Optimism/Defensive	2.63	6.04	(.645)																								
2. Performance Time 1	5.88	3.1	0.132																								
3. Performance Time 2	6.87	3.72	0.166	.720**																							
4. Performance Time 3	5.77	3.14	0.206	.704**	.757**																						
5. Performance Time 4	5.52	3.11	0.246	.656**	.658**	.673**																					
6. Performance Time 5	5.41	3.17	0.209	.668**	.710**	.697**	.736**																				
7. Sum of Performance	29.45	14.15	0.219	.859**	.892**	.879**	.851**	.873**																			
8. Positive Affect Time 1	33.65	9.71	0.234	-.046	-.013	.044	-.014	-.047	-.017	(.932)																	
9. Positive Affect Time 2	35.31	10.03	0.239	-.023	.023	.062	.028	-.024	.016	.890**	(.939)																
10. Positive Affect Time 3	32.09	11.07	0.200	-.066	.014	.050	.016	-.016	.000	.830**	.850**	(.952)															
11. Positive Affect Time 4	29.85	11.89	0.186	-.100	-.023	.041	.000	.009	-.017	.758**	.748**	.901**	(.952)														
12. Average Positive Affect	32.72	9.97	0.228	-.065	.000	.052	.008	-.019	-.005	.924**	.927**	.962**	.921**	(.949)													
13. Negative Affect Time 1	14.63	7.05	-.255	-.179**	-.152**	-.171**	-.262**	-.281**	-.238**	.015	-.016	.042	.054	.028	(.928)												
14. Negative Affect Time 2	15.11	7.39	-.288	-.157**	-.156**	-.145**	-.257**	-.230**	-.216**	-.008	-.058	.005	.036	-.005	.885**	(.929)											
15. Negative Affect Time 3	15.49	7.46	-.283	-.156**	-.169**	-.140**	-.272**	-.234**	-.222**	.024	-.011	.014	.039	.019	.838**	.889**	(.925)										
16. Negative Affect Time 4	16.12	8.01	-.26	-.180**	-.159**	-.159**	-.277**	-.268**	-.237**	.076	.036	.051	.015	.046	.781**	.799**	.878**	(.926)									
17. Average Negative Affect	15.34	7.03	-.289	-.179**	-.169**	-.163**	-.284**	-.270**	-.243**	.030	-.012	.030	.038	.024	.928**	.948**	.960**	.924**	(.955)								
18. Self-Efficacy Time 1	422.16	178.65	0.203	.364**	.410**	.459**	.428**	.402**	.473**	.292**	.355**	.276**	.269**	.317**	-.112	-.145*	-.103	-.113	-.126*	(.941)							
19. Self-Efficacy Time 2	386.38	191.31	0.19	.392**	.487**	.514**	.437**	.407**	.515**	.298**	.344**	.387**	.365**	.375**	-.132*	-.124*	-.141*	-.139*	-.143*	.831**	(.940)						
20. Self-Efficacy Time 3	362.39	200.87	0.171	.324**	.461**	.503**	.466**	.452**	.507**	.272**	.319**	.373**	.430**	.378**	-.148*	-.121	-.122	-.143*	-.142*	.788**	.889**	(.942)					
21. Average Self-Efficacy	390.31	179.68	0.199	.380**	.481**	.522**	.470**	.446**	.529**	.304**	.358**	.368**	.379**	.379**	-.139*	-.137*	-.129*	-.140*	-.145*	.920**	.962**	.949**	(.938)				
22. Goal Commitment Time 1	3.34	0.87	0.300	.207**	.164**	.222**	.249**	.194**	.236**	.285**	.341**	.347**	.297**	.340**	-.210*	-.248**	-.239**	-.230**	-.247**	.336**	.347**	.321**	.354**	(.736)			
23. Goal Commitment Time 2	3.13	1.00	0.267	.160**	.155**	.213**	.203**	.146**	.200**	.249**	.298**	.397**	.348**	.350**	-.146*	-.170**	-.210**	-.179**	-.188**	.224**	.365**	.320**	.323**	.789**	(.800)		
24. Goal Commitment Time 3	3.04	1.11	0.226	.126**	.135**	.219**	.209**	.195**	.201**	.294**	.304**	.444**	.496**	.419**	-.147*	-.138*	-.177**	-.201**	-.178**	.224**	.339**	.415**	.349**	.712**	.838**	(.828)	
25. Average Goal Commitment	3.17	0.92	0.282	.174**	.163**	.235**	.236**	.193**	.228**	.299**	.338**	.432**	.420**	.403**	-.178*	-.195**	-.223**	-.219**	-.217**	.278**	.378**	.385**	.370**	.889**	.950**	.931**	(.910)

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

M is the mean of that variable.

SD is the standard deviation for the variable

encouragement condition (yes, no), and the continuous variable, representing the likelihood of utilizing one cognitive strategy over another, such that as an individual moves on the scale toward defensive pessimism, the likelihood of a defensive pessimistic strategy is greater, as an individual moves on the scale toward optimism, the likelihood of an optimistic strategy is greater, and in the middle of the scale we are less confident about the likelihood of choosing one cognitive strategy over another.

Table 3

*Means and Standard Deviations on Performance across conditions*

	Goal Condition	
	Do-your-best	Specific Difficult
Encouragement	Mean (SD)	Mean (SD)
No	25.29 (12.26)	31.81 (12.84)
Yes	29.38 (12.95)	32.00 (17.27)

*Note. SD represents the standard deviation for the group*

Table 4 shows the results from the first set of regression analyses. In these analyses, the main effects were entered first, so that Model 1 investigated the variance in performance explained by the primary independent variables: goal condition, encouragement condition, and cognitive strategy (optimism-defensive pessimism). Model 2 included the same variables from the previous model, and added in the two-way interactions between the primary independent variables (i.e., goal condition x encouragement condition, goal condition x optimism-defensive pessimism, and encouragement condition x optimism-defensive pessimism). Model 3 included the same variables from the previous models, and added in the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism. Lastly, Model 4 added in positive affect, negative affect, goal commitment, and self-efficacy as control variables. These variables are treated as dependent variables in later analyses, but in goal setting literature

they tend to mediate the goal setting to performance relationship through self-regulation processes. Thus, Model 4 is the most complete model and represents the theory of motivation for this study. Each of the four models predicting performance were compared to one another. These comparisons are displayed in Table 5.

A second hierarchical multiple regression analysis was done controlling for positive affect, negative affect, goal commitment, and self-efficacy from the beginning to measure the direct effects of the primary independent variables in all of the models. Table 6 shows the results from the hierarchical regression analyses investigating the effects of the independent variables after the control variables are put into the model, in order to identify differences between putting them into the models first versus putting them into the models last. In these analyses, Model 1 consists of the control variables predicting performance: positive affect, negative affect, goal commitment, and self-efficacy. Model 2 included the same control variables, but added in main effects, including the goal condition, the encouragement condition, and the optimism-defensive pessimism variable. Model 3 included all of the variables from the previous models, and added in the two-way interaction variables between goals and encouragement, goals and optimism-defensive pessimism, and encouragement and optimism-defensive pessimism. Lastly, model 4 included all of the variables from the previous models, and added in the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism. Each of the four models predicting performance were compared to one another. These comparisons are displayed in Table 7.

As a means of comparison, simple regressions were calculated that depict a three-way interaction that includes all four of the conditions. These can be used to compare the results presented in Table 4 and Table 6 in terms of how well they represented the hypothesis and as a

comparison to look at other relevant interactions. Results of the first set of hierarchical multiple regression analyses showed that model 1, which consisted only of the main effects for the primary independent variables control variables (i.e., goal condition, encouragement condition, optimism-defensive pessimism) explained 7.86% of the variance in performance, which was found to be statistically significant ( $F(3, 252) = 7.17, p < .001$ ). Model 2 added in the two-way interactions between the primary independent variables and explained 10.53% of the variance in performance, which was not found to be statistically significant ( $F(6, 249) = 4.89, p = .08$ ). The R-squared difference between model 1 and model 2 was .03, and as noted in Table 5, was not found to be statistically significant ( $F(3, 249) = 2.48, p = .06$ ). Model 3 added in the three-way interaction between the primary independent variables and explained 11.53% of the variance in performance, which was found to be statistically significant ( $F(7, 248) = 4.62, p < .001$ ). The R-squared difference between model 2 and model 3 was .01 which was not found to be statistically significant ( $F(1, 248) = 2.80, p = .10$ ). Lastly, model 4 added in positive affect, negative affect, goal commitment, and self-efficacy as control variables since they are known to influence performance. This model can be considered the theory of motivation for this study. This model accounted for 40.51% of the variance in performance, and was found to be statistically significant ( $F(11, 244) = 15.10, p < .001$ ). The difference in R-squared between model 3 and model 4 was .29 which was found to be statistically significant ( $F(4, 244) = 29.71, p < .001$ ).

For the second set of hierarchical analyses which controlled for positive affect, negative affect, goal commitment, and self-efficacy from the beginning, results differed slightly. Results of this hierarchical multiple regression analyses showed that model 1, which consisted only of the control variables (i.e., positive affect, negative affect, self-efficacy, and goal commitment) explained 35.74% of the variance in performance, which was found to be statistically significant

( $F(4, 251) = 34.89, p < .001$ ). Model 2 included the main effects of the focal predictors (i.e., goal condition, encouragement condition, and optimism-defensive pessimism) and explained 37.35%

Table 4

*Regression Analysis on Performance*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Main Effects for IVs</b>								
Goal Condition	4.54 (1.71)	2.65 (.01)	7.43 (2.46)	3.03 (.003)	8.37 (2.51)	3.33 ( $<.001$ )	5.80 (2.14)	2.71 (.007)
Encourage Condition	1.71 (1.72)	1.00 (.32)	1.84 (2.48)	.74 (.46)	3.07 (2.58)	1.19 (.24)	2.49 (2.14)	1.16 (.25)
<u>OptDefPes</u>	.50 (.14)	3.48 ( $<.001$ )	.42 (.22)	1.90 (.06)	.60 (.25)	2.44 (.02)	.28 (.21)	1.31 (.19)
<b>Two Ways for IVs</b>								
Goal*Encourage			-3.63 (3.41)	-1.06 (.29)	-6.18 (3.72)	-1.66 (.10)	-6.65 (3.10)	-2.15 (.03)
Goal* <u>Opt/DefPes</u>			-.43 (.29)	-1.52 (.13)	-.87 (.39)	-2.25 (.03)	-.63 (.32)	-1.96 (.05)
Encourage* <u>OptDefPes</u>			.61 (.29)	2.13 (.03)	.15 (.40)	.38 (.71)	.31 (.33)	.94 (.35)
<b>Three Ways for IVs</b>								
Goal*Encourage* <u>OptDefPes</u>					.96 (.57)	1.67 (.09)	.60 (.48)	1.26 (.21)
<b>Controls</b>								
Positive Affect							-.37 (.08)	-4.53 ( $<.001$ )
Negative Affect							-.17 (.11)	-1.56 (.12)
Goal Commitment							1.51 (.92)	1.64 (.10)
Self-Efficacy							.04 (.01)	9.45 ( $<.001$ )
R-Squared	.0786		.1053		.1153		.4051	
(Adjusted R-Squared)	(.0676)		(.0838)		(.0904)		(0.3782)	

Note. *OptDefPes* represents the *Optimism-Defensive Pessimism Construct*.

*Encourage* represents the *encouragement condition*

*Goal* represents the *goal condition*

*B* is beta: the unstandardized coefficients.

*SE* is the standard error for the coefficients

*t* is the *t*-statistic

*p* is the *p*-value for the *t*-statistic

Table 5:

*Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	0.03	2.48 (.06)	0.04	2.58 (.04)	0.33	16.74 (<.001)
Model 2	-	-	0.01	2.80 (.10)	0.30	24.54 (<.001)
Model 3	-	-	-	-	0.29	29.71 (<.001)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

F is the F-statistic for the ANOVA between the two models

P is the p-value for the F-statistic from the ANOVA between the two models

of the variance in performance, which was found to be statistically significant ( $F(7, 248) = 21.12, p < .001$ ). The R-squared difference between model 1 and model 2 was .02, and as noted in Table 7, was not found to be statistically significant ( $F(3, 248) = 2.13, p = .10$ ). Model 3 included the two-way interactions between the focal predictors (i.e., goal x encouragement, goal x optimism-defensive pessimism, encouragement x optimism-defensive pessimism). Model 3 explained 40.12% of the variance in performance and was statistically significant ( $F(10, 245) = 16.41, p < .001$ ). The R-squared difference between model 2 and model 3 was .03 which was statistically significant ( $F(3, 245) = 3.78, p = .01$ ). Lastly, model 4 was the same model 4 from the first set of analyses, and the difference in R-squared between model 3 and model 4 was .01 which was not statistically significant ( $F(1, 244) = 1.59, p = .21$ ). R-squared differences between all the models are shown in Table 7.

When the Model 1 showed the total effects of the primary independent variables on performance, the main effects of goal condition and optimism-defensive pessimism were found to be statistically significant, as shown in Table 4. However, when the control variables were put in the models from the beginning, showing the direct effects of the primary independent

variables on performance in model 2, only the main effect for optimism-defensive pessimism was found to be statistically significant, as shown in Table 6. In looking at the differences

Table 6

*Regression Analysis on Performance*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Controls</b>								
Positive Affect	-0.36 (.08)	-4.40 ( $<.001$ )	-.38 (.08)	-4.60 ( $<.001$ )	-.38 (.08)	-4.61 ( $<.001$ )	-.37 (.08)	-4.53 ( $<.001$ )
Negative Affect	-0.27 (.11)	-2.55 (.01)	-.20 (.11)	-1.79 (.08)	-.18 (.11)	-1.70 (.09)	-.17 (.11)	-1.56 (.12)
Self-Efficacy	.05 (.01)	10.07 ( $<.001$ )	.04 (.01)	9.34 ( $<.001$ )	.04 (.01)	9.48 ( $<.001$ )	.04 (.01)	9.45 ( $<.001$ )
Goal Commitment	1.39 (.90)	1.54 (.12)	1.43 (.94)	1.53 (.13)	1.53 (.92)	1.66 (.10)	1.51 (.92)	1.64 (.10)
<b>Main Effects for IVs</b>								
Goal Condition			1.75 (1.51)	1.16 (.25)	5.17 (2.09)	2.48 (.01)	5.80 (2.14)	2.71 (.007)
Encourage Condition			.85 (1.43)	.59 (.56)	1.70 (2.05)	.83 (.41)	2.49 (2.14)	1.16 (.25)
<u>OptDefPes</u>			.27 (.13)	2.07 (.04)	.16 (.19)	.84 (.40)	.28 (.21)	1.31 (.19)
<b>Two Ways for IVs</b>								
Goal*Encourage					-5.03 (2.82)	-1.78 (.08)	-6.65 (3.10)	-2.15 (.03)
Goal* <u>Opt/DefPes</u>					-.36 (.24)	-1.50 (.14)	-.63 (.32)	-1.96 (.05)
Encourage* <u>OptDefPes</u>					.60 (.24)	2.53 (.01)	.31 (.33)	.94 (.35)
<b>Three Ways for IVs</b>								
Goal*Encourage* <u>OptDefPes</u>							.60 (.48)	1.26 (.21)
R-Squared	.3574		.3735		.4012		.4051	
(Adjusted R-Squared)	(0.3471)		(0.3558)		(0.3767)		(0.3782)	

Note. OptDefPes represents the Optimism-Defensive Pessimism Construct.

Encourage represents the encouragement condition

Goal represents the goal condition

B is beta: the unstandardized coefficients.

SE is the standard error for the coefficients

t is the t-statistic

p is the p-value for the t-statistic

Table 7

*Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	0.02	2.13 (.10)	0.04	2.99 (.01)	0.05	2.80 (.01)
Model 2	-		0.03	3.78 (.01)	0.03	3.24 (.01)
Model 3	-		-		0.01	1.59 (.21)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

F is the F-statistic for the ANOVA between the two models

P is the p-value for the F-statistic from the ANOVA between the two models

between the analyses for two-way interactions, the interaction between encouragement and optimism-defensive pessimism is statistically significant when controls are not included (as shown in Table 4, Model 2), and when they are included (as shown in Table 6, Model 3). Also, when the controls are included, the two-way interaction between goal condition and encouragement condition has a high regression coefficient ( $B = -5.03$ ,  $SE = 2.82$ ), and approaches without reaching statistical significance ( $p = .08$ ). When the controls are included and these two-way interactions between independent variables are included (as shown in Table 6, Model 3), the main effect for goal condition reaches statistical significance ( $p = .01$ ).

When the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism is included in the models, it approaches but does not achieve statistical significance when the controls are not included (as shown in Table 4, Model 3) with a regression coefficient of .96, but has less of an impact when the controls already are included (as shown in Table 6, Model 4), with a regression coefficient of .60. When the controls are not included, the addition of this three-way interaction resulted in a larger but still not statistically significant regression coefficient for the two-way interaction between goal and encouragement than when the control variables were present, a larger and statistically significant regression



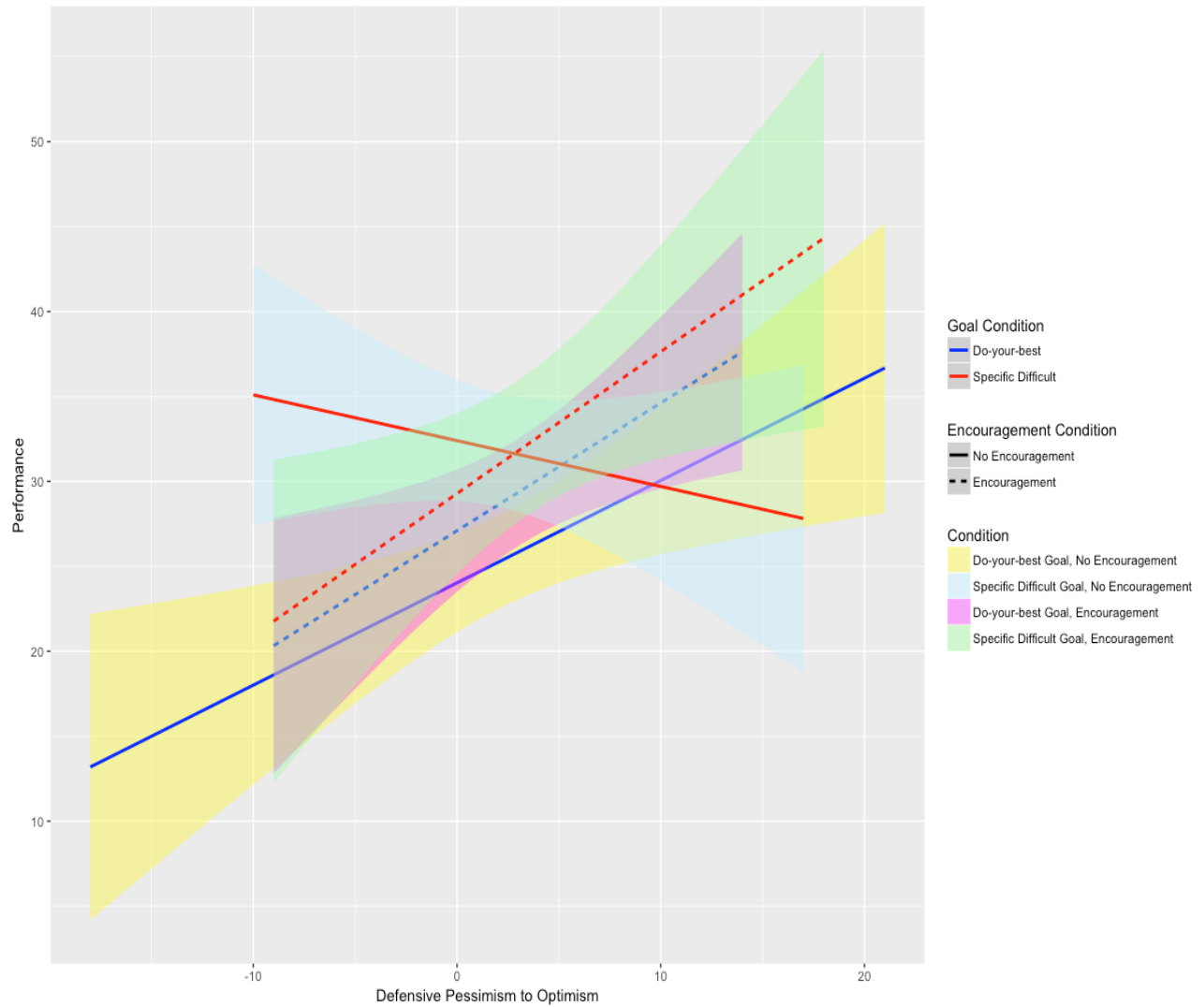
coefficient for the two-way interaction between goals and optimism-defensive pessimism than when the control variables were present, and a smaller regression coefficient for the two-way interaction between encouragement and optimism-defensive pessimism, which lost statistical significance when the control variables were not included (Table 4) versus when they were (Table 6).

Model 4 was considered the complete model, representing the theory of motivation for this study. Once the control variables were put into Model 4 after not being in any of the previous models (Table 4), positive affect and self-efficacy were found to have statistically significant regression coefficients, while when the control variables were put in all of the models (Table 6), positive affect, negative affect, and self-efficacy all had statistically significant regression coefficients when predicting performance alone, and the effects of negative affect on performance were reduced as interactions between the independent variables were included. The effects of goal commitment increased as interactions between the independent variables were incorporated (though never reaching statistical significance). Additionally, the main effect for goal condition remained statistically significant both before and after the control variables were incorporated, but the main effect for optimism-defensive pessimism lost its statistical significance. Additionally, the two-way interaction between goal condition and encouragement achieved statistical significance when the control variables were incorporated, and though the regression coefficient for the two-way interaction between goal condition and optimism-defensive pessimism was reduced, this interaction was still found to be statistically significant. Lastly, the regression coefficient for the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism was reduced when the control variables were incorporated into the models, though it continued to have a relatively high weight.

In order to show the patterns of results, Figure 3 shows the results of the regression analysis and includes the 95% confidence intervals for performance for each of the regression lines. The regression lines in Figure 3 show the interaction between goal condition, encouragement condition, and optimism-defensive pessimism on performance without controlling for positive affect, negative affect, goal commitment, and self-efficacy, thus, Figure 3 shows the total effects for this interaction.

Figure 3:

*Three-way Interaction on Performance*



As Figure 3 shows, as an individual approaches an optimistic strategy, performance increases across all conditions except the specific difficult goal and no encouragement condition, in which performance tends to decrease. The presence of encouragement increased performance as individuals were more likely to utilize an optimistic strategy. Additionally, when individuals were more likely to utilize a defensive pessimistic strategy, the presence of a specific difficult goal led to higher levels of performance than a do-your-best goal.

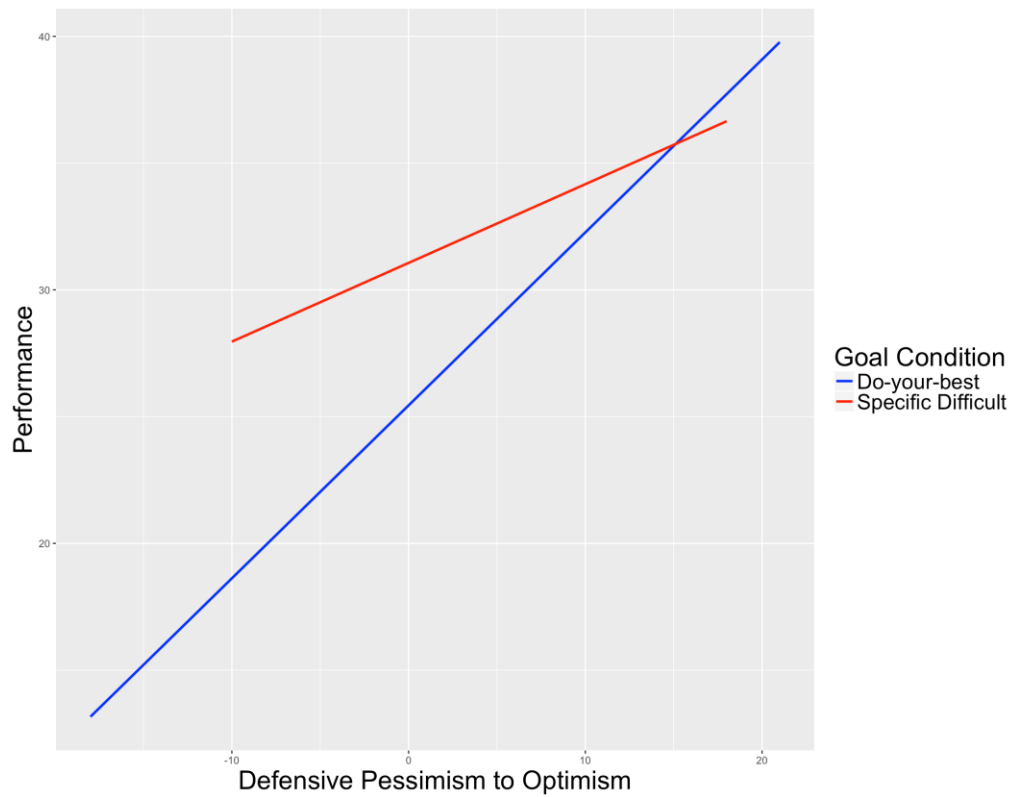
Hypothesis 1 predicted that individuals higher in optimism would perform better with specific difficult goals and encouragement, and individuals higher in defensive pessimism would perform worse with specific difficult goals and encouragement. To test this hypothesis, models 3 and 4 from the direct effects hierarchical regression analyses with controls were compared to one another. Model 4 included all of the predictors that model 3 had, and added the three-way interaction term between goal condition, encouragement condition, and optimism-defensive pessimism. While the addition of the three-way interaction term did not yield statistical significance ( $F(1, 244) = 1.59, p = .21$ ), it did explain additional variance in performance. In examining this difference using the total effects models before controls were added, the addition of the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism similarly did not improve the model fit statistically significantly beyond the model with just the main effects and two-way interactions of the variables significant ( $F(1, 248) = 2.80, p = .10$ ), though there was an improvement in R-squared. Thus, both versions of the hierarchical models yielded similar results, showing that the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism did explain additional variance in performance, though this difference was not found to be statistically significant.

As shown in Figure 3, the more defensively pessimistic an individual is, the more beneficial the combination of a specific difficult goal and no encouragement is to the individual. The presence of specific difficult goals instead of do-your-best goals enhances performance levels for defensive pessimists. However, when individuals who are more defensively pessimistic receive a specific difficult goal and encouragement, they perform worse than when they received the specific difficult goal without encouragement. On the other hand, the more optimistic an individual is, the more encouragement enhances performance levels. Specific difficult goals appear to also benefit individuals higher in optimism, though without the additional encouragement, the positive effect of specific difficult goals on performance is diminished. Overall, the individuals who are more optimistic tend to outperform individuals who are more defensively pessimistic, except when they are both assigned a specific difficult goal and not given encouragement, in which individuals who are more defensively pessimistic outperform individuals who are more optimistic.

Additional figures were created to better explore the three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism. Figure 4 shows performance scores across the defensive pessimism-optimism scores for both goal conditions, including both encouragement manipulations. Figure 4 shows that as individuals are more likely to utilize a defensive pessimism strategy, they perform better with specific difficult goals than do-your-best goals, and this effect is reduced the more an individual is likely to take on an optimistic strategy. Figures 5a and 5b show the two-way interaction between goal condition and optimism-defensive pessimism in the different encouragement conditions. Figure 5a shows the interaction in the no encouragement condition, while Figure 5b shows the interaction in the encouragement condition.

Figure 4:

*Goal Condition and Strategy on Performance*



Figures 5a and 5b

*Goal Condition and Strategy for Different Encouragement Conditions*

Figure 5a: No Encouragement

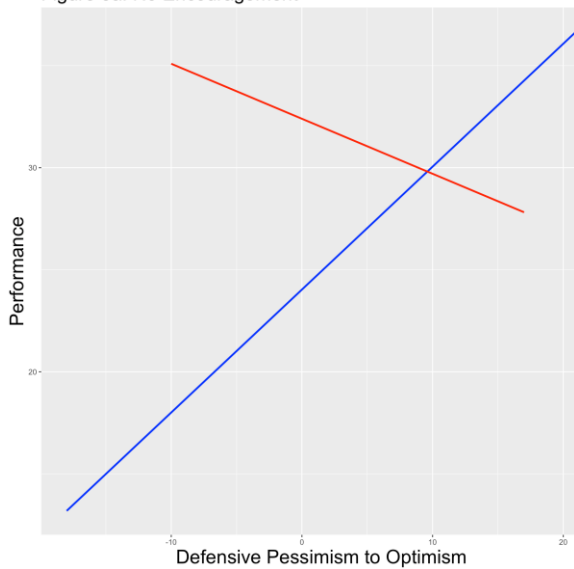


Figure 5b: Encouragement

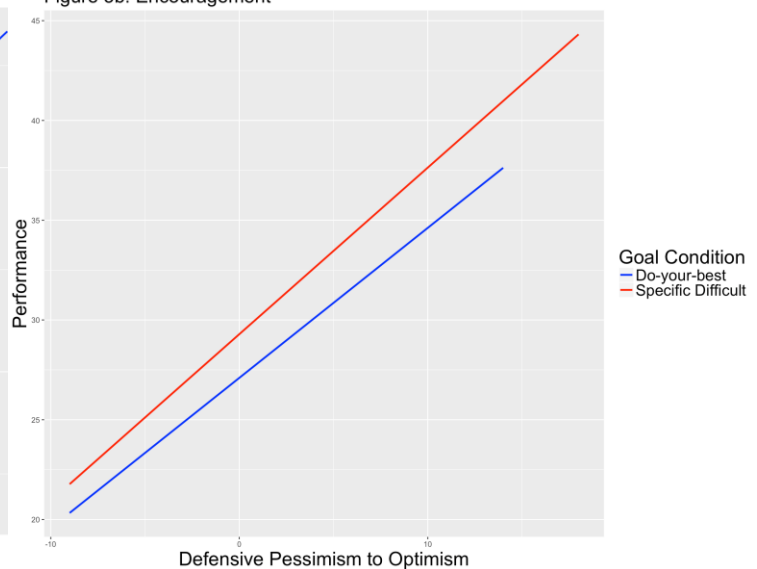
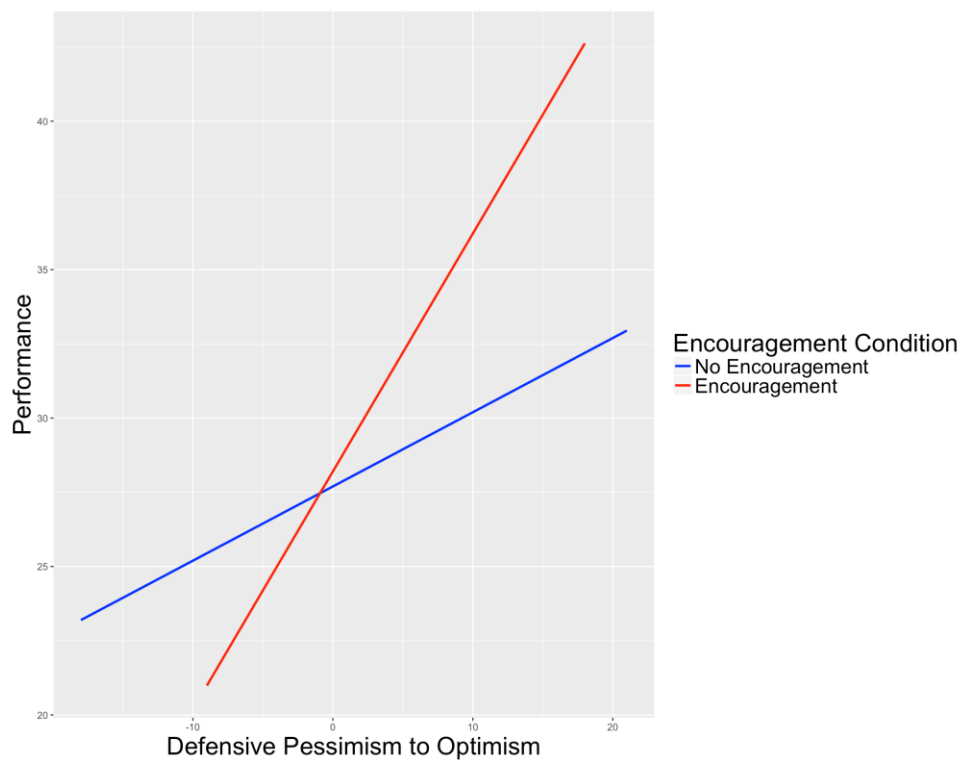


Figure 5a shows that when encouragement is not present, the more likely an individual is to take on a defensive pessimism strategy, the better they will perform with a specific difficult goal, but the worse they will perform with a do-your-best goal. The opposite effect is shown for an individual more likely to take on an optimism strategy, but to a lesser extent, in that they will still perform at relatively high levels with either type of goal, but a do-your-best goal increases performance as the likelihood an individual takes on an optimistic strategy increases, while a specific difficult goal trends toward decreasing performance as the likelihood an individual take on an optimistic strategy increases. Figure 5b shows that with encouragement, across all levels of optimism-defensive pessimism, specific difficult goals lead to higher levels of performance than do-your-best goals, and performance is increased the more as individuals move towards becoming more likely to utilize an optimistic strategy. Figure 6 shows performance scores across the optimism-defensive pessimism range comparing the encouragement conditions.

Figure 6:

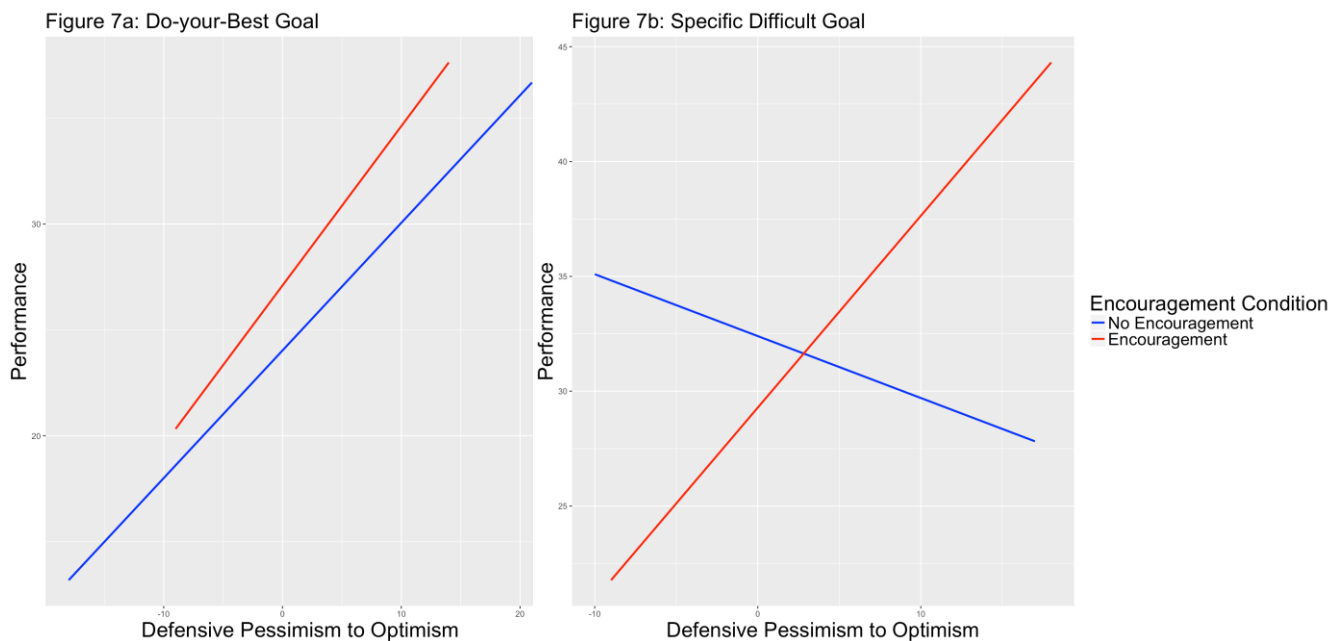
*Encouragement Condition and Strategy on Performance*



As Figure 6 shows, the more likely an individual is to take on an optimistic strategy, the more encouragement enhances performance. However, even with no encouragement, individuals more likely to utilize an optimistic strategy perform at higher levels than individuals more likely to utilize a defensive pessimistic strategy. Figures 7a and 7b show the performance scores across the varying optimism-defensive pessimism scores for the encouragement condition separating out the goal condition. Thus, Figure 7a shows this interaction for the do-your-best goal condition, and Figure 7b shows this interaction for the specific difficult goal condition.

Figures 7a and 7b

*Encouragement Condition and Strategy for Different Goal Conditions*

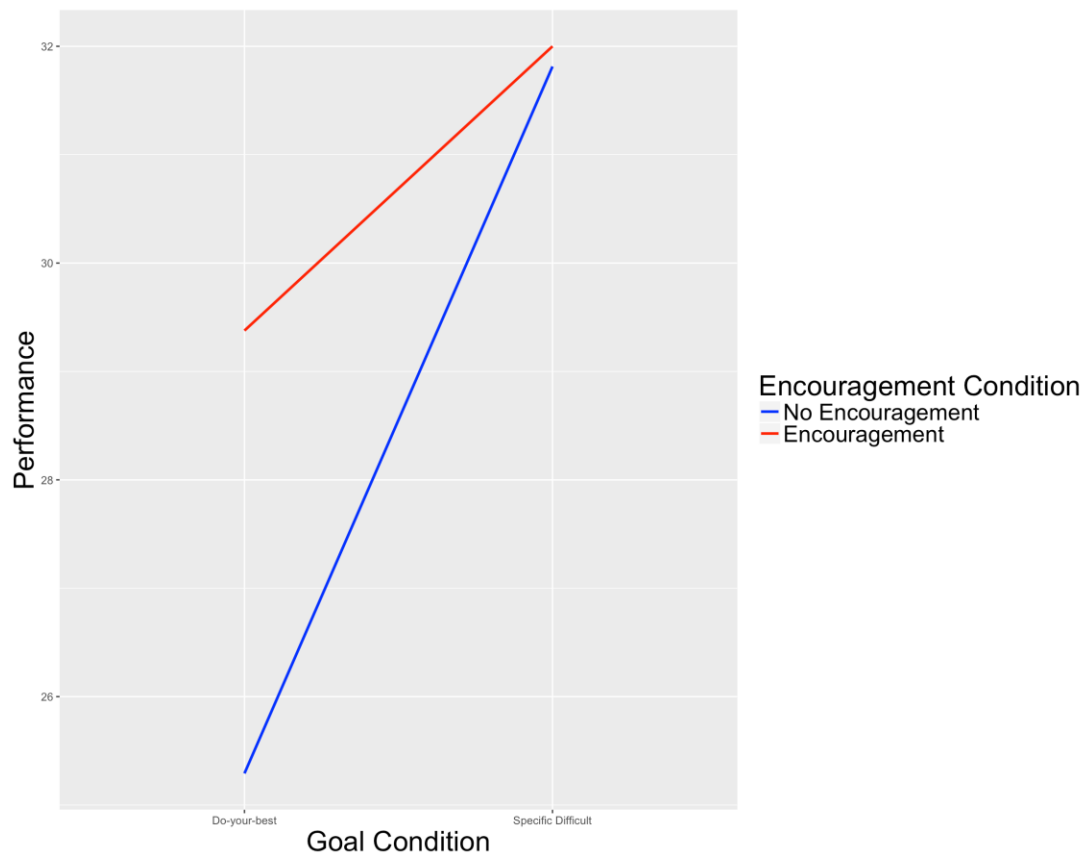


As Figure 7a shows, in the do-your-best goal condition, performance is improved as individuals increase in the likelihood of utilizing an optimistic strategy. Additionally, the

presence of encouragement results in higher levels of performance across all levels of optimism-defensive pessimism. However, in the specific difficult goal condition, the presence of encouragement increases performance as individuals move from a defensive pessimism strategy to an optimism strategy, while the absence of encouragement decreases performance as individuals move from a defensive pessimism strategy to an optimism strategy. Lastly, the interaction between goal condition and encouragement condition were examined. Figure 8 shows the interaction between goal condition and encouragement condition across all levels of optimism-defensive pessimism.

Figure 8

*Goal Condition and Encouragement Condition on Performance*

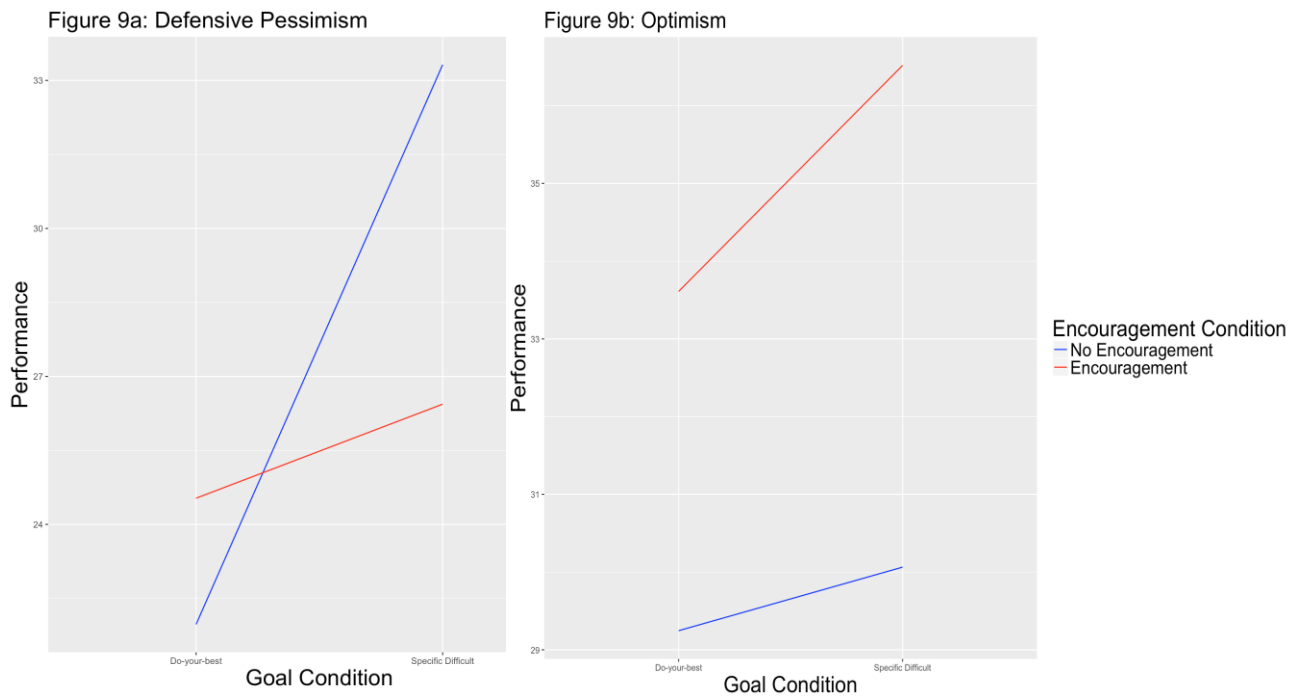




Figures 9a and 9b show the interaction between encouragement condition and goal condition for individuals who are more likely to take on a defensive pessimistic strategy (one standard deviation below the mean on optimism-defensive pessimism) and for individuals who are more likely to take on an optimistic strategy (one standard deviation above the mean on optimism-defensive pessimism). As shown in Figures 9a and 9b, performance is significantly improved with a specific difficult goal over a do-your-best goal. When individuals are more likely to take on a defensive pessimism strategy, performance is the highest with no encouragement and a specific difficult goal, and the lowest with no encouragement and a do-your-best goal. Within the encouragement condition, these individuals see a slight improvement in performance moving from the do-your-best goal condition to the specific difficult goal condition, and within the no encouragement condition, these individuals see a significant

Figures 9a and 9b

*Goal Condition and Encouragement Condition for Different Strategies*



improvement in performance moving from the do-your-best goal condition to the specific difficult goal condition. When individuals are more likely to take on an optimistic strategy, performance is the highest with encouragement and a specific difficult goal, and lowest with no encouragement and a do-your-best goal. The presence of encouragement significantly improves performance for these individuals. Specific difficult goals significantly improve performance for these individuals when encouragement is also present, and slightly improves performance for these individuals when encouragement is absent.

Table 8 shows predicted performance scores and the prediction interval for specific goal and encouragement conditions. The predicted scores were calculated for three levels of optimism-defensive pessimism, which include what will be called a stereotypical “defensive pessimist”, with a score that is standard deviation below the mean on optimism-defensive pessimism (-3.31), an individual who is considered “average” due to a mean score on optimism-defensive pessimism (2.63), and an individual who is considered a stereotypical “optimist”, with a score that is one standard deviation above the mean on optimism-defensive pessimism (8.66). The four conditions for prediction are as follows: do-your-best goal and no encouragement, do-your-best goal and encouragement, specific difficult goal and no encouragement, specific difficult goal and encouragement. All of the conditions assume mean levels of positive affect, negative affect, goal commitment, and self-efficacy.

As shown in Table 8 and Figure 3, someone who may be considered more of a defensive pessimist performs at the highest levels when they are given a specific difficult goal but no encouragement. In the do-your-best goal and no encouragement condition, performance scores increased as individuals became more optimistic. The same pattern was found in the do-your-best goal and encouragement condition, as well as the specific difficult goal and encouragement

condition. However, in the specific difficult goal and no encouragement condition, performance increased as individuals became more defensively pessimistic.

Table 8

*Performance Predictions for Different Conditions*

	Defensive Pessimist Prediction (Prediction Interval)	Average Prediction (Prediction Interval)	Optimist Prediction (Prediction Interval)
Do-your-best Goal No Encouragement	25.30 (3.03, 47.56)	26.98 (4.84, 49.12)	28.66 (6.35, 50.96)
Do-your-best Goal Encouragement	26.73 (4.32, 49.14)	30.27 (8.11, 52.44)	33.81 (11.47, 56.16)
Specific Difficult Goal No Encouragement	33.25 (10.91, 55.60)	31.12 (8.95, 53.28)	28.98 (6.58, 51.50)
Specific Difficult Goal Encouragement	25.99 (3.60, 48.38)	29.34 (7.17, 51.50)	32.69 (10.38, 54.99)

As such, hypothesis 1 was not supported. The presence of encouragement and assigned specific difficult goals did improve performance for individuals higher in optimism, but the presence of specific difficult goals also improved performance for individuals higher in defensive pessimism, as long as encouragement was absent. Additionally, the presence of encouragement led to higher levels of performance for individuals more likely to take on a defensive pessimism strategy in the do-your-best goal condition than the specific difficult goal condition. However, these results were not found to be statistically significant.

**Positive Affect**

Table 9 shows the means and standard deviations for positive affect across the different conditions. In order to investigate positive affect, a similar analysis plan as the performance analyses was utilized, except that the control variables (negative affect, goal commitment, and self-efficacy) were entered into the equation first. The results of putting them in last were not

tabled because as they are considered mediating variables, a simpler analysis was warranted. Thus, model 1 consisted of the control variables, model 2 added in the primary independent variables (goal condition, encouragement condition, optimism-defensive pessimism), model 3 included the two-way interactions between these primary independent variables, and model 4 added in the three-way interactions between these primary independent variables, as the most complete model. Table 10 shows the hierarchical regression results on positive affect for the four models. Each of the four models predicting positive affect were compared to one another. These comparisons are displayed in Table 11.

Table 9

*Means and Standard Deviations on Positive Affect across conditions*

Encouragement	Goal Condition	
	Do-your-best Mean (SD)	Specific Difficult Mean (SD)
No	33.72 (9.59)	32.39 (9.65)
Yes	32.67 (9.73)	31.96 (11.01)

*Note. SD represents the standard deviation for the group*

Results of the hierarchical multiple regression analyses on positive affect showed that model 1, which consisted only of the control variables (i.e., negative affect, self-efficacy, and goal commitment) explained 24.12% of the variance in positive affect, which was found to be statistically significant ( $F(3, 252) = 26.70, p < .001$ ). Model 2 included the main effects of the focal predictors (i.e., goal condition, encouragement condition, and optimism-defensive pessimism) and explained 26.16% of the variance in positive affect, which was found to be statistically significant ( $F(6, 249) = 14.70, p < .001$ ). The R-squared difference between model 1 and model 2 was .02, and as noted in Table 9, was not found to be statistically significant ( $F(3, 249) = 2.29, p = .08$ ). Model 3 included the two-way interactions between the focal predictors (i.e., goal x encouragement, goal x optimism-defensive pessimism, encouragement x optimism-

Table 10

*Regression Analysis on Positive Affect*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Controls</b>								
Negative Affect	.19 (.08)	2.41 (.02)	.23 (.08)	2.80 (.01)	.23 (.08)	2.80 (.01)	.22 (.08)	2.68 (.01)
Self-Efficacy	.02 (.003)	4.68 (<.001)	.02 (.003)	4.55 (<.001)	.02 (.003)	4.52 (<.001)	.02 (.003)	4.53 (<.001)
Goal Commitment	3.58 (.65)	5.50 (<.001)	3.11 (.69)	4.54 (<.001)	3.10 (.69)	4.48 (<.001)	3.10 (.69)	4.48 (<.001)
<b>Main Effects for IV's</b>								
Goal Condition			-.75 (1.15)	-.65 (.52)	-.55 (1.63)	-.34 (.74)	-.89 (1.67)	-.53 (.58)
Encourage Condition			-1.02 (1.09)	-.94 (.35)	-.51 (1.60)	-.32 (.75)	-.94 (1.67)	-.56 (.58)
OptDefPes			.27 (.10)	2.43 (.02)	.28 (.15)	1.88 (.06)	.22 (.08)	1.30 (.20)
<b>Two Ways for IV's</b>								
Goal*Encourage					-.48 (2.20)	-.22 (.83)	.41 (2.42)	.17 (.87)
Goal*Opt/DefPes					.02 (.18)	.09 (.93)	.17 (.25)	.66 (.51)
Encourage*OptDefPes					-.11 (.18)	-.59 (.56)	.05 (.26)	.19 (.85)
<b>Three Ways for IV's</b>								
Goal*Encourage* OptDefPes							-.33 (.37)	-.88 (.38)
R-Squared	.2412		.2616		.2627		.2651	
(Adjusted R-Squared)	(.2321)		(.2438)		(.2358)		(.2351)	

Note. OptDefPes represents the Optimism-Defensive Pessimism Construct.

Encourage represents the encouragement condition

Goal represents the goal condition

B is beta: the unstandardized coefficients.

SE is the standard error for the coefficients

t is the t-statistic

p is the p-value for the t-statistic

Table 11

*Positive Affect Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	.02	2.29 (.08)	.02	1.20 (.31)	.02	1.14 (.34)
Model 2	-		.001	.13 (.94)	.004	.29 (.88)
Model 3	-		-		.002	.78 (.38)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

*F* is the F-statistic for the ANOVA between the two models

*p* is the p-value for the F-statistic from the ANOVA between the two models

defensive pessimism). Model 3 explained 26.27% of the variance in positive affect and was statistically significant ( $F(9, 246) = 9.74, p < .001$ ). The R-squared difference between model 2 and model 3 was .001 which was not statistically significant ( $F(3, 246) = .13, p = .94$ ). Model 4 included the three-way interaction between the focal predictors (goal condition x encouragement condition x optimism-defensive pessimism), which explained 26.51% of the variance in positive affect and was found to be statistically significant ( $F(10, 245) = 8.84, p < .001$ ). The difference in R-squared between Model 3 and Model 4 was .002 which was not statistically significant ( $F(1, 245) = .78, p = .38$ ). R-squared differences between all the models are shown in Table 11. Negative affect, self-efficacy, and goal commitment all were statistically significant in accounting for variance in positive affect throughout all of the models. Optimism-defensive pessimism showed a statistically significant main effect predicting positive affect, but this effect was reduced when the two- and three-way interactions were added, though none of those were found to be large enough to be statistically significant.

Hypothesis 2 predicted a three-way interaction between goal condition, encouragement condition, and optimism-defensive pessimism, such that positive affect would be higher for individuals who were assigned a specific difficult goal and given encouragement if they were

more optimistic, and lower for individuals who were assigned specific difficult goals and given encouragement if they were higher on defensive pessimism. A plot showing the three-way interaction on positive affect is shown in Figure 10. As Figure 10 shows, overall, the more optimistic an individual was the more positive affect they reported, and the more defensively pessimistic an individual was, the less positive affect they reported. Individuals who were more defensively pessimistic had the lowest levels of positive affect when they were assigned a specific difficult goal but not given encouragement, even though this is where individuals who were more defensively pessimistic performed at the highest levels.

Individuals who were more defensively pessimistic had the highest levels of positive affect when they received a do-your-best goal and no encouragement. Additionally, individuals who were more optimistic had higher levels of positive affect when they did not receive encouragement than when they did. Thus, hypothesis 2 was partially supported, as the more defensively pessimistic an individual is, the less positive affect they report, but for individuals higher in defensive pessimism, the presence of specific difficult goals and no encouragement led to the lowest levels of positive affect, while for individuals higher in optimism, individuals given a specific difficult goal and no encouragement, or given a do-your-best goal and no encouragement, had the highest levels of positive affect.

Table 12 shows predicted positive affect scores and the prediction intervals for specific goal and encouragement conditions. The predicted positive affect scores are calculated for three levels of optimism-defensive pessimism, which include what will be called a stereotypical “defensive pessimist”, with a score that is standard deviation below the mean on optimism-defensive pessimism (-3.41), an individual who is considered “average” due to a mean score on optimism-defensive pessimism (2.63), and an individual who is considered a stereotypical

“optimist”, with a score that is one standard deviation above the mean on optimism-defensive pessimism (8.66). The four conditions for prediction are as follows: do-your-best goal and no encouragement, do-your-best goal and encouragement, specific difficult goal and no encouragement, specific difficult goal and encouragement. All of the conditions assume mean levels of negative affect, goal commitment, and self-efficacy. From these exemplars, it is clear that individuals who are more defensively pessimistic tend to have lower levels of positive affect, regardless of the condition they are in, but experience the lowest levels of positive affect when they are assigned a specific difficult goal and not given encouragement, which is a situation in which an optimist experiences the most positive affect.

Figure 10

*Three-way Interaction on Positive Affect*

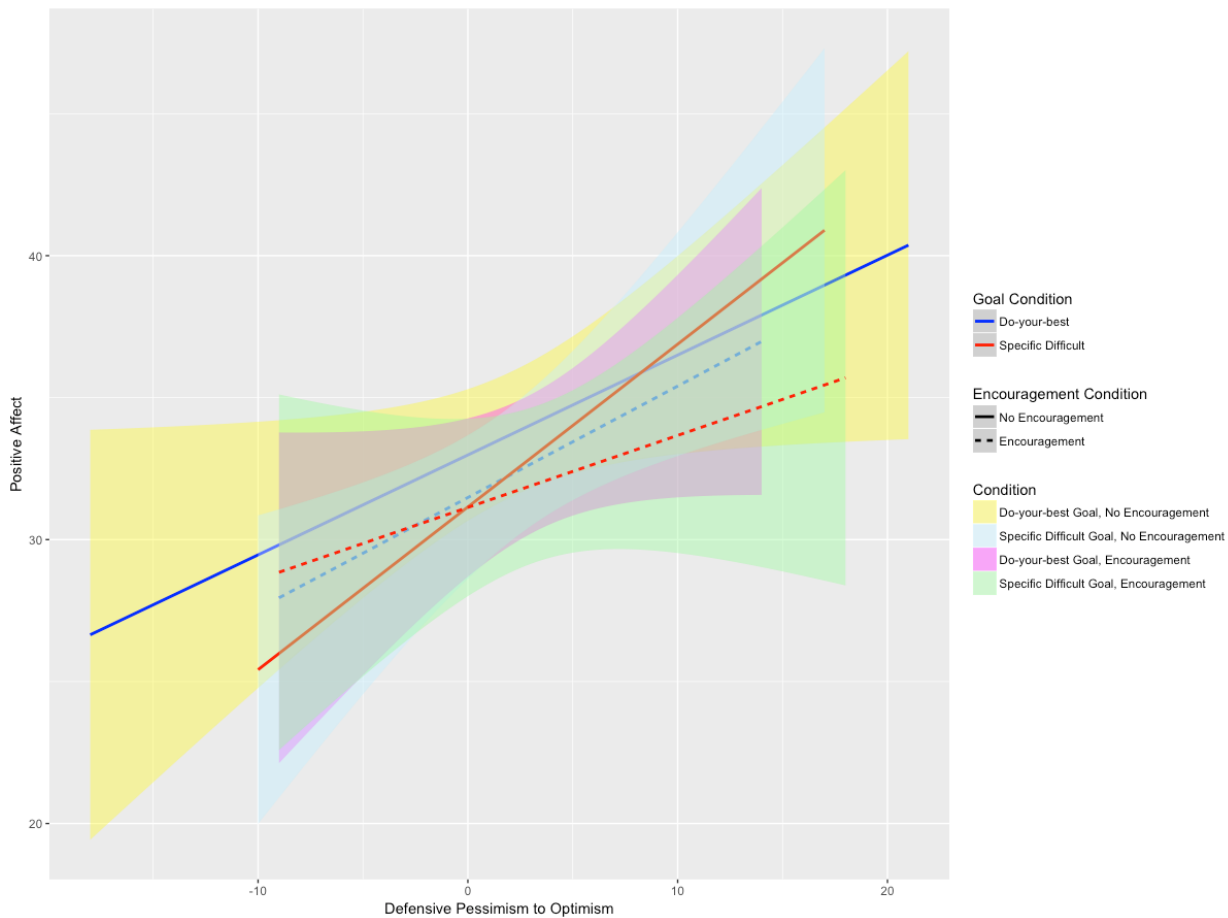




Table 12

*Positive Affect Predictions for Different Conditions*

	Defensive Pessimist Prediction (Prediction Interval)	Average Prediction (Prediction Interval)	Optimist Prediction (Prediction Interval)
Do-your-best Goal No Encouragement	-0.54 (-17.94, 16.86)	0.76 (-16.55, 18.06)	2.05 (-15.38, 19.48)
Do-your-best Goal Encouragement	-1.65 (-19.16, 15.86)	-0.05 (-17.37, 17.27)	1.55 (-15.92, 19.01)
Specific Difficult Goal No Encouragement	-2.00 (-19.46, 15.46)	0.30 (-17.03, 17.62)	2.60 (-14.90, 20.10)
Specific Difficult Goal Encouragement	-1.58 (-19.08, 15.91)	-0.96 (-18.28, 16.36)	-0.33 (-17.76, 17.10)

**Negative Affect**

The means and standard deviations for negative affect across all conditions are displayed in Table 13. In order to investigate negative affect, a similar analysis plan used in the positive affect analysis was utilized in that the control variables (positive affect, goal commitment, and self-efficacy) were entered into the equation first. The results of putting them in last were not tabled because as they are considered mediating variables, a simpler analysis was warranted. Thus, model 1 consisted of the control variables, model 2 added in the primary independent

Table 13

*Means and Standard Deviations on Negative Affect across conditions*

	Goal Condition	
	Do-your-best Mean (SD)	Specific Difficult Mean (SD)
Encouragement		
No	16.51 (8.22)	14.55 (5.55)
Yes	15.27 (7.01)	14.81 (6.73)

*Note.* SD represents the standard deviation for the group

variables (goal condition, encouragement condition, optimism-defensive pessimism), model 3 included the two-way interactions between the primary independent variables, and model 4 added in the three-way interactions between the primary independent variables, as the most complete model. Table 14 shows the regression results for negative affect. Each of the four models predicting negative were compared to one another. These comparisons are displayed in Table 15.

Results of the hierarchical multiple regression analyses on negative affect showed that model 1, which consisted only of the control variables (i.e., positive affect, self-efficacy, and goal commitment) explained 7.35% of the variance in negative affect, which was found to be statistically significant ( $F(3, 252) = 6.66, p < .001$ ). Model 2 included the main effects of the focal predictors (i.e., goal condition, encouragement condition, and optimism-defensive pessimism) and explained 14.40% of the variance in negative affect, which was found to be statistically significant ( $F(6, 249) = 6.98, p < .001$ ). The R-squared difference between model 1 and model 2 was .07, and as noted in Table 15, was found to be statistically significant ( $F(3, 249) = 6.84, p < .001$ ). Model 3 included the two-way interactions between the focal predictors (i.e., goal x encouragement, goal x optimism-defensive pessimism, encouragement x optimism-defensive pessimism). Model 3 explained 14.79% of the variance in negative affect and was statistically significant ( $F(9, 246) = 4.75, p < .001$ ). The R-squared difference between model 2 and model 3 was .004 which was not statistically significant ( $F(3, 246) = .38, p = .77$ ). Model 4 included the three-way interaction between the focal predictors (goal condition x encouragement condition x optimism-defensive pessimism), which explained 15.68% of the variance in negative affect and was found to be statistically significant ( $F(10, 245) = 4.56, p < .001$ ). The difference in R-squared between model 3 and model 4 was .01 which was not statistically significant ( $F(1,$

245) = 2.58,  $p = .11$ ). R-squared differences between all the models are shown in Table 15. A plot of the three-way interaction on negative affect is shown in Figure 11.

Table 14

*Regression Analysis on Negative Affect*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Controls</b>								
Positive Affect	.12 (.05)	2.41 (.02)	.13 (.05)	2.80 (.01)	.13 (.05)	2.80 (.01)	.13 (.05)	2.68 (.01)
Self-Efficacy	-.01 (.003)	-1.76 (.08)	-.003 (.003)	-1.02 (.31)	-.003 (.003)	-1.05 (.30)	-.003 (.003)	-.10 (.32)
Goal Commitment	-1.84 (.52)	-3.51 ( $<.001$ )	-1.63 (.53)	-3.06 (.002)	-1.63 (.54)	-3.05 (.003)	-1.60 (.53)	-3.00 (.003)
<b>Main Effects for IV's</b>								
Goal Condition			-1.39 (.87)	-1.60 (.11)	-2.28 (1.23)	-1.86 (.06)	-2.72 (1.25)	-2.17 (.03)
Encourage Condition			-.13 (.83)	-.16 (.87)	-.96 (1.21)	-.79 (.43)	-1.54 (1.26)	-1.22 (.22)
<u>OptDefPes</u>			-.30 (.07)	-4.11 ( $<.001$ )	-.33 (.11)	-2.99 (.003)	-.42 (.12)	-3.40 ( $<.001$ )
<b>Two Ways for IV's</b>								
Goal*Encourage					1.56 (1.67)	.94 (.35)	2.76 (1.82)	1.51 (.13)
Goal* <u>Opt/DefPes</u>					.05 (.14)	.35 (.73)	.25 (.19)	1.34 (.18)
Encourage* <u>OptDefPes</u>					.03 (.14)	.20 (.84)	.24 (.19)	1.26 (.21)
<b>Three Ways for IV's</b>								
Goal*Encourage* <u>OptDefPes</u>							-.45 (.28)	-1.61 (.11)
R-Squared	.0735		.1440		.1479		.1568	
(Adjusted R-Squared)	(.0625)		(.1234)		(.1168)		(.1224)	

Note. *OptDefPes* represents the Optimism-Defensive Pessimism Construct.

*Encourage* represents the encouragement condition

*Goal* represents the goal condition

*B* is beta: the unstandardized coefficients.

*SE* is the standard error for the coefficients

*t* is the *t*-statistic

*p* is the *p*-value for the *t*-statistic

Table 15

*Negative Affect Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	.07	6.84 (<.001)	.07	3.58 (.002)	.08	3.46 (.001)
Model 2	-		.004	.38 (.77)	.01	.93 (.45)
Model 3	-		-		.01	2.58 (.11)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

*F* is the F-statistic for the ANOVA between the two models

*p* is the p-value for the F-statistic from the ANOVA between the two models

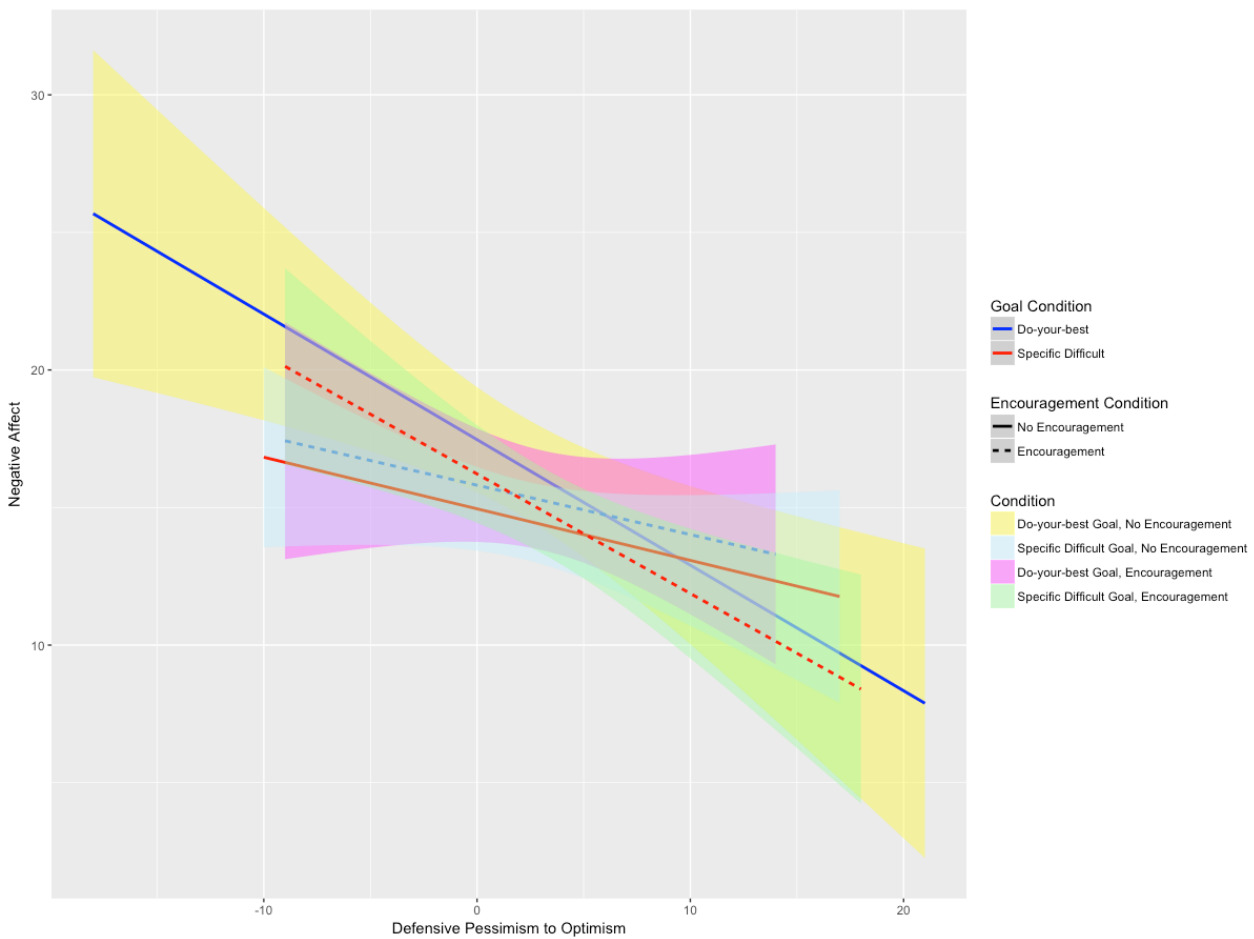
Hypothesis 3 predicted that individuals who were more defensively pessimistic would have higher levels of negative affect than individuals who were more optimistic, and the presence of encouragement and specific difficult goals would increase these effects. As Figure 11 shows, the more optimistic an individual was, the less negative affect they reported, and the more defensively pessimistic an individual was, the more negative affect they reported. The highest levels of negative affect were reported by individuals who were more defensively pessimistic and who received a do-your-best goal but no encouragement. Individuals who were more optimistic had higher levels of negative affect when they received a do-your-best goal and encouragement. Hypothesis 3 was therefore partially supported, as optimists did have lower levels of negative affect than defensive pessimists, but this effect was not strengthened by the presence of encouragement or specific difficult goals.

Table 16 shows predicted negative affect scores and the prediction intervals for specific goal and encouragement conditions. The predicted negative affect scores are calculated for three levels of optimism-defensive pessimism, which include what will be called a stereotypical “defensive pessimist”, with a score that is one standard deviation below the mean on optimism-defensive pessimism (-3.41), an individual who is considered “average” due to a mean score on

optimism-defensive pessimism (2.63), and an individual who is considered a stereotypical “optimist”, with a score that is one standard deviation above the mean on optimism-defensive pessimism (8.66). The four conditions for prediction are as follows: do-your-best goal and no encouragement, do-your-best goal and encouragement, specific difficult goal and no encouragement, specific difficult goal and encouragement. All of the conditions assume mean levels of positive affect, goal commitment, and self-efficacy.

Figure 11

*Three-way Interaction on Negative Affect*



From Table 16 it is clear that overall, defensive pessimists experience the highest levels of negative affect compared to other individuals, regardless of the goal or encouragement condition they are in. Defensive pessimists experience the highest levels of negative affect when they are in the do-your-best goal condition but not given encouragement, and experience the lowest levels of negative affect when they are assigned a specific difficult goal but not given encouragement. Optimists tend to experience low levels of negative affect, and experience the lowest levels when they are assigned a specific difficult goal and given encouragement. Optimists experience more negative affect when they are given a do-your-best goal and given encouragement.

Table 16

*Negative Affect Predictions for Different Conditions*

	Defensive Pessimist Prediction (Prediction Interval)	Average Prediction (Prediction Interval)	Optimist Prediction (Prediction Interval)
Do-your-best Goal No Encouragement	3.54 (-9.58, 16.67)	1.03 (-12.03, 14.09)	-1.49 (-14.65, 11.67)
Do-your-best Goal Encouragement	1.17 (-12.05, 14.39)	0.13 (-12.95, 13.20)	-0.92 (-14.10, 12.27)
Specific Difficult Goal No Encouragement	-0.05 (-13.23, 13.14)	-1.03 (-14.11, 12.05)	-2.01 (-15.22, 11.21)
Specific Difficult Goal Encouragement	1.86 (-11.34, 15.07)	-0.35 (-13.43, 12.73)	-2.56 (-15.72, 10.60)

**Goal Commitment**

The means and standard deviations for goal commitment across all the conditions are presented in Table 17. In order to investigate goal commitment, a similar analysis plan as the positive and negative affect analyses was utilized in that the control variables (positive affect, negative affect, and self-efficacy) were entered into the equation first. The results of putting them

in last were not tabled because as they are considered mediating variables, a simpler analysis was warranted.

Table 17

*Means and Standard Deviations on Goal Commitment across conditions*

Encouragement	Do-your-best Mean (SD)	Specific Difficult Mean (SD)
No	3.34 (.92)	3.02 (.93)
Yes	3.30 (.85)	2.99 (.94)

*Note. SD represents the standard deviation for the group*

Thus, model 1 consisted of the control variables, model 2 added in the primary independent variables (goal condition, encouragement condition, optimism-defensive pessimism), model 3 included the two-way interactions between the primary independent variables, and model 4 added in the three-way interactions between the primary independent variables, as the most complete model. Results from the hierarchical multiple regression analyses for goal commitment are displayed in Table 18. Each of the four models predicting goal commitment were compared to one another. These comparisons are displayed in Table 19.

Results of the hierarchical multiple regression analyses on goal commitment showed that model 1, which consisted only of the control variables (i.e., positive affect, negative affect, and self-efficacy) explained 25.36% of the variance in goal commitment, which was found to be statistically significant ( $F(3, 252) = 28.53, p < .001$ ). Model 2 included the main effects of the focal predictors (i.e., goal condition, encouragement condition, and optimism-defensive pessimism) and explained 31.46% of the variance in goal commitment, which was found to be statistically significant ( $F(6, 249) = 19.05, p < .001$ ). The R-squared difference between model 1

and model 2 was .06, and as noted in Table 19, was found to be statistically significant ( $F(3, 249) = 7.40, p < .001$ ).

Table 18

*Regression Analysis on Goal Commitment*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Controls</b>								
	.03	5.50	.03	4.54	.02	4.48	.02	4.48
Positive Affect	(.01)	(<.001)	(.01)	(<.001)	(.01)	(<.001)	(.01)	(<.001)
Negative Affect	-.03	-3.51	-.02	-3.06	-.02	-3.05	-.02	-3.00
	(.01)	(<.001)	(.01)	(.002)	(.01)	(.003)	(.01)	(.003)
Self-Efficacy	.001	3.66	.001	4.38	.001	4.43	.001	4.41
	(.0003)	(<.001)	(.0003)	(<.001)	(.0003)	(<.001)	(.0003)	(<.001)
<b>Main Effects for IV's</b>								
Goal Condition			-.40	-4.03	-.44	-3.07	-.43	-2.92
			(.10)	(<.001)	(.14)	(.002)	(.15)	(.004)
Encourage Condition			-.07	-.76	-.04	-.31	-.03	-.23
			(.10)	(.45)	(.14)	(.76)	(.15)	(.82)
<u>OptDefPes</u>			.02	2.25	.01	.79	.01	.81
			(.01)	(.03)	(.01)	(.43)	(.02)	(.42)
<b>Two Ways for IV's</b>								
Goal*Encourage					-.05	-.25	-.07	-.33
					(.20)	(.81)	(.22)	(.75)
Goal* <u>Opt/DefPes</u>					.02	1.36	.02	.83
					(.02)	(.17)	(.02)	(.41)
Encourage* <u>OptDefPes</u>					-.003	-.18	-.01	-.30
					(.02)	(.86)	(.02)	(.77)
<b>Three Ways for IV's</b>								
Goal*Encourage* <u>OptDefPes</u>							.008	.24
							(.03)	(.81)
R-Squared	.2536		.3146		.3198		.3200	
(Adjusted R-Squared)	(.2447)		(.2981)		(.2949)		(.2922)	

Note. *OptDefPes* represents the Optimism-Defensive Pessimism Construct.

*Encourage* represents the encouragement condition

*Goal* represents the goal condition

*B* is beta: the unstandardized coefficients.

*SE* is the standard error for the coefficients

*t* is the *t*-statistic

*p* is the *p*-value for the *t*-statistic



Table 19

*Goal Commitment Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	.06	7.40 (<.001)	.07	3.99 (<.001)	.07	3.42 (.002)
Model 2	-		.01	.62 (.60)	.005	.48 (.75)
Model 3	-		-		.0002	.06 (.81)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

F is the F-statistic for the ANOVA between the two models

p is the p-value for the F-statistic from the ANOVA between the two models

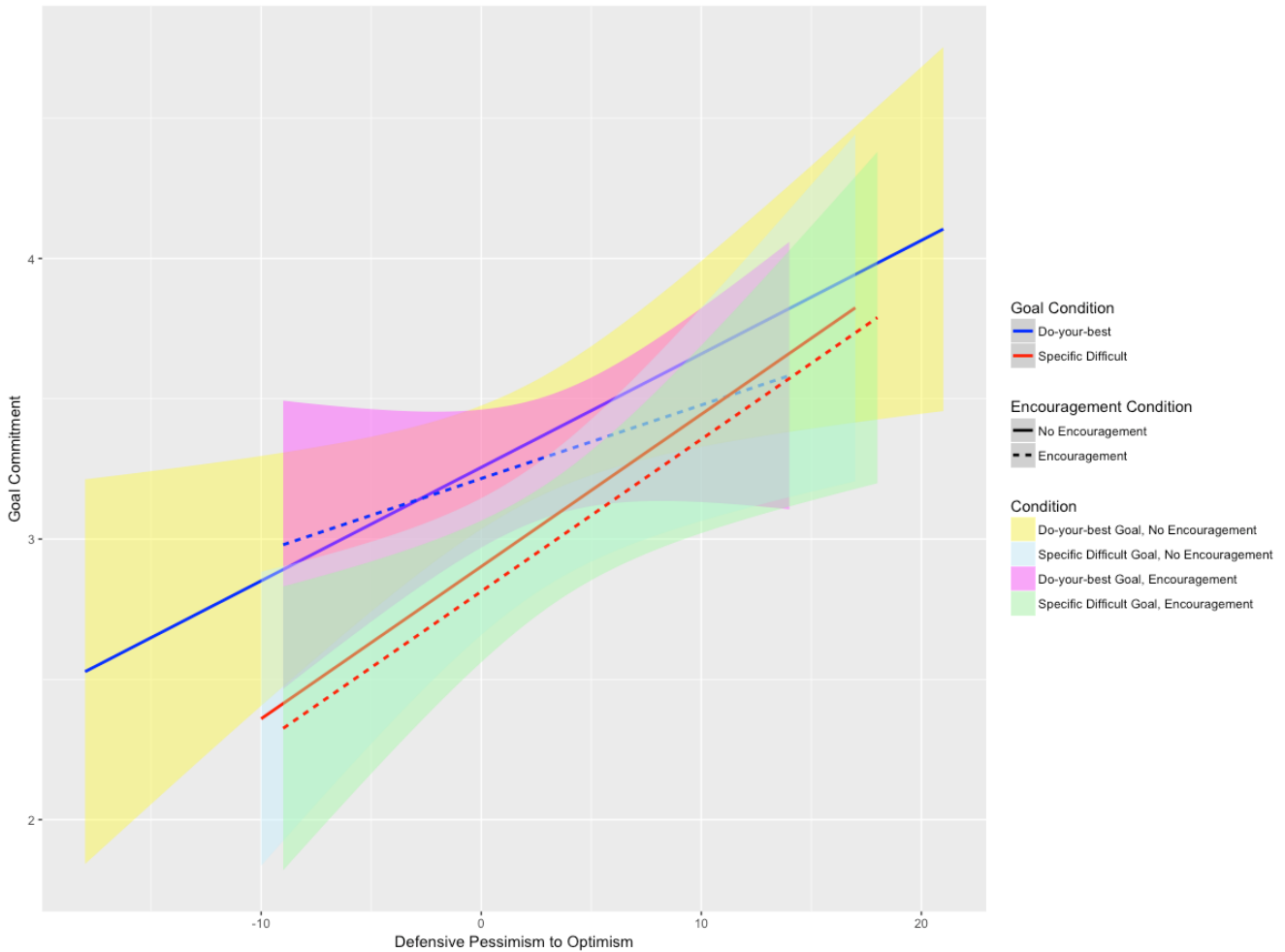
Model 3 included the two-way interactions between the focal predictors (i.e., goal x encouragement, goal x optimism-defensive pessimism, encouragement x optimism-defensive pessimism). Model 3 explained 31.98% of the variance in goal commitment and was statistically significant ( $F(9, 246) = 12.85, p < .001$ ). The R-squared difference between model 2 and model 3 was .01 which was not statistically significant ( $F(3, 246) = .62, p = .60$ ). Model 4 included the three-way interaction between the focal predictors (goal condition x encouragement condition x optimism-defensive pessimism), which explained 32.00% of the variance in goal commitment and was found to be statistically significant ( $F(10, 245) = 11.53, p < .001$ ). The difference in R-squared between model 3 and model 4 was .0002 which was not statistically significant ( $F(1, 245) = .06, p = .81$ ). R-squared differences between all the models are shown in Table 19. A plot showing the three-way interaction for goal commitment is in Figure 12.

Hypothesis 4a predicted that individuals in the do-your-best goal condition would have higher levels of goal commitment than those in the specific difficult goal condition. As Figure 12 shows, individuals who received a do-your-best goal did have higher levels of goal commitment than individuals who received specific difficult goals, but as optimism increased, this difference

diminished, but across models the main effect for goal condition on goal commitment was statistically significant, thus supporting this hypothesis.

Figure 12

*Three-way interaction on Goal Commitment*



Hypothesis 4b predicted that there would be an interaction between goal commitment and goal type on performance, in that effect of having high goal commitment on performance would be greater for individuals who were in the specific difficult goal condition therefore leading to

higher levels of performance than individuals who were in the do-your-best goal condition. A regression model was created in which total performance was predicted using goal condition, encouragement condition, optimism-defensive pessimism, two-way interactions between each of those focal predictors, a three-way interaction between the focal predictors, control variables (positive affect, negative affect, self-efficacy, goal commitment) and a two-way interaction variable between goal condition and goal commitment. The model itself explained a significant proportion of the variance in performance ( $R^2 = .4051$ ,  $F(12, 243) = 13.95$ ,  $p < .001$ ). However, the interaction between goal condition and goal commitment was not statistically significant ( $b = 1.77$ ,  $SE = 1.64$ ,  $t(243) = 1.08$ ,  $p = 0.28$ ). A comparison between this model and model 4 on performance (included all the same variables except the two-way interaction term between goal commitment and goal condition) showed a difference in R-squared of .003 and yielded null results ( $F(1, 243) = 1.16$ ,  $p = 0.28$ ). Hypothesis 4b was therefore not supported, as even though there was a slight increase in the proportion of variance explained when adding in a two-way interaction variable between goal condition and goal commitment, it was not statistically significant.

Hypothesis 4c predicted that defensive pessimists would exhibit lower levels of goal commitment than optimists. As Figure 12 shows, individuals who were more defensively pessimistic did have lower levels of goal commitment than optimists, so this hypothesis was supported. The highest levels of goal commitment was shown with optimists who received a do-your-best goal and no encouragement, while the lowest levels of goal commitment were found with individuals who were more defensively pessimistic who were assigned a specific difficult goal, and the presence of encouragement was slightly worse for goal commitment for these individuals.

Table 20 shows predicted goal commitment scores and the prediction intervals for the different goal and encouragement conditions. The predicted goal commitment scores are calculated for three levels of optimism-defensive pessimism, which include what will be called a stereotypical “defensive pessimist”, with a score that is one standard deviation below the mean on optimism-defensive pessimism (-3.41), an individual who is considered “average” due to a mean score on optimism-defensive pessimism (2.63), and an individual who is considered a stereotypical “optimist”, with a score that is one standard deviation above the mean on optimism-defensive pessimism (8.66).

The four conditions for prediction are as follows: do-your-best goal and no encouragement, do-your-best goal and encouragement, specific difficult goal and no encouragement, specific difficult goal and encouragement. All of the conditions assume mean levels of positive affect, negative affect, and self-efficacy. Overall, it appears that individuals who are more optimistic report higher levels of goal commitment than individuals who are average or more defensively pessimistic in the same goal and encouragement condition. Across Table 20

*Goal Commitment Predictions for Different Conditions*

	Defensive Pessimist Prediction (Prediction Interval)	Average Prediction (Prediction Interval)	Optimist Prediction (Prediction Interval)
Do-your-best Goal No Encouragement	0.15 (-1.40, 1.69)	0.22 (-1.32, 1.75)	0.29 (-1.25, 1.84)
Do-your-best Goal Encouragement	0.14 (-1.42, 1.69)	0.17 (-1.37, 1.70)	0.20 (-1.35, 1.75)
Specific Difficult Goal No Encouragement	-0.34 (-1.89, 1.21)	-0.16 (-1.70, 1.38)	0.02 (-1.53, 1.58)
Specific Difficult Goal Encouragement	0.02 (-1.53, 1.58)	-0.26 (-1.80, 1.28)	-0.07 (-1.62, 1.48)

individuals, the lowest levels of goal commitment were reported in the specific difficult goal and encouragement condition, and being assigned to do-your-best goals leads to higher levels of goal commitment for both optimists and defensive pessimists.

### **Self-Efficacy**

The means and standard deviations for self-efficacy across all of the conditions are presented in Table 21. In order to investigate self-efficacy, a similar analysis plan as the previous control analyses was utilized in that the control variables (positive affect, negative affect, and goal commitment) were entered into the equation first. The results of putting them in last were not tabled because as they are considered mediating variables, a simpler analysis was warranted. Thus, model 1 consisted of the control variables, model 2 added in the primary independent variables (goal condition, encouragement condition, optimism-defensive pessimism), model 3 included the two-way interactions between the primary independent variables, and Model 4 added in the three-way interactions between the primary independent variables, as the most complete model. Table 22 shows the results of the hierarchical multiple regression models. Each of the four models predicting self-efficacy were compared to one another. These comparisons are displayed in Table 23.

Table 21

#### *Means and Standard Deviations on Self-Efficacy across conditions*

Encouragement	Goal Condition	
	Do-your-best Mean (SD)	Specific Difficult Mean (SD)
No	361.72 (178.85)	402.03 (188.25)
Yes	358.79 (139.26)	441.70 (197.04)

*Note. SD represents the standard deviation for the group*

Results of the hierarchical multiple regression analyses on self-efficacy showed that model 1, which consisted only of the control variables (i.e., positive affect, negative affect, and goal commitment) explained 20.96% of the variance in self-efficacy, which was found to be statistically significant ( $F(3, 252) = 22.27, p < .001$ ). Model 2 included the main effects of the focal predictors (i.e., goal condition, encouragement condition, and optimism-defensive pessimism) and explained 26.50% of the variance in self-efficacy, which was found to be statistically significant ( $F(6, 249) = 14.96, p < .001$ ). The R-squared difference between model 1 and model 2 was .06, and as noted in Table 23, was found to be statistically significant ( $F(3, 249) = 6.26, p < .001$ ).

Model 3 included the two-way interactions between the focal predictors (i.e., goal x encouragement, goal x optimism-defensive pessimism, encouragement x optimism-defensive pessimism). Model 3 explained 27.12% of the variance in self-efficacy and was statistically significant ( $F(9, 246) = 10.17, p < .001$ ). The R-squared difference between model 2 and model 3 was .01 which was not statistically significant ( $F(3, 246) = .69, p = .56$ ). Model 4 included the three-way interaction between the focal predictors (goal condition x encouragement condition x optimism-defensive pessimism), which explained 27.17% of the variance in self-efficacy and was found to be statistically significant ( $F(10, 245) = 9.14, p < .001$ ). The difference in R-squared between model 3 and model 4 was .001 which was not statistically significant ( $F(1, 245) = .18, p = .67$ ). R-squared differences between all the models are shown in Table 23. Figure 13 shows the results of the three-way interaction for self-efficacy.

Table 22

*Regression Analysis on Self-Efficacy*

Predictors	Model 1		Model 2		Model 3		Model 4	
	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)	B (SE)	t (p)
<b>Controls</b>								
	5.20	4.68	4.98	4.55	4.97	4.52	4.99	4.53
Positive Affect	(1.11)	(<.001)	(1.10)	(<.001)	(1.10)	(<.001)	(1.10)	(<.001)
	-2.60	-1.76	-1.52	-1.02	-1.58	-1.05	-1.51	-1.00
Negative Affect	(1.48)	(.08)	(1.50)	(.31)	(1.50)	(.30)	(1.52)	(.32)
Goal Commitment	45.20	3.66	54.18	4.38	54.94	4.43	54.82	4.41
	(12.35)	(<.001)	(12.36)	(<.001)	(12.42)	(<.001)	(12.44)	(<.001)
<b>Main Effects for IV's</b>								
			81.29	4.06	68.31	2.37	71.19	2.40
Goal Condition			(20.02)	(<.001)	(28.86)	(.02)	(29.71)	(.02)
			21.67	1.10	-1.03	-.04	2.67	.09
Encourage Condition			(19.64)	(.27)	(28.70)	(.97)	(30.06)	(.93)
			.93	.53	2.13	.80	2.68	.90
<u>OptDefPes</u>			(1.77)	(.60)	(2.68)	(.43)	(2.98)	(.37)
<b>Two Ways for IV's</b>								
					44.19	1.12	36.57	.84
Goal*Encourage					(39.36)	(.26)	(43.38)	(.40)
					-3.25	-.99	-4.55	-1.01
Goal* <u>Opt/DefPes</u>					(3.30)	(.33)	(4.51)	(.31)
					.60	.18	-.75	-.16
Encourage* <u>OptDefPes</u>					(3.30)	(.86)	(4.61)	(.87)
<b>Three Ways for IV's</b>								
							2.81	.42
Goal*Encourage* <u>OptDefPes</u>							(6.66)	(.67)
R-Squared	.2096		.2650		.2712		.2717	
(Adjusted R-Squared)	(.2002)		(.2473)		(.2445)		(.2420)	

Note. *OptDefPes* represents the Optimism-Defensive Pessimism Construct.

*Encourage* represents the encouragement condition

*Goal* represents the goal condition

*B* is beta: the unstandardized coefficients.

*SE* is the standard error for the coefficients

*t* is the *t*-statistic

*p* is the *p*-value for the *t*-statistic

Table 23

*Self-Efficacy Model Comparisons*

	Model 2		Model 3		Model 4	
	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)	R <sup>2</sup> Diff	F (p)
Model 1	.06	6.26 (<.001)	.06	3.46 (.003)	.06	2.98 (.005)
Model 2	-		.01	.69 (.56)	.01	.56 (.69)
Model 3	-		-		.001	.18 (.67)

*Note.* R<sup>2</sup> Diff is the difference between the R-squared values between the models

*F* is the F-statistic for the ANOVA between the two models

*p* is the p-value for the F-statistic from the ANOVA between the two models

As Figure 13 shows, as individuals become more likely to take on an optimistic strategy, performance is improved. Additionally, the presence of specific difficult goals appears to lead to higher levels of self-efficacy than do-your-best goals across nearly all levels of optimism-defensive pessimism. However, the lines are not entirely parallel, which indicates that the different conditions have different influences on self-efficacy. The do-your-best goal and no encouragement condition leads to the lowest levels of self-efficacy for individuals more likely to utilize a defensively pessimistic strategy, but approaches the highest levels of self-efficacy as individuals are more likely to utilize an optimistic strategy.

Hypothesis 5 investigated the difference in self-efficacy between the different conditions for optimists and defensive pessimists, and predicted that overall, defensive pessimists would have lower levels of self-efficacy than optimists, and these effects would increase with the presence of encouragement and specific difficult goals. As Figure 13 shows, individuals higher in optimism did have higher levels of self-efficacy than individuals higher in defensive pessimism, thus hypothesis 5a was supported. Additionally, the presence of specific difficult goals led to higher levels of self-efficacy than do-your-best goals which remained true across the optimism-defensive pessimism spectrum. Across all optimism-defensive pessimism scores, the



highest levels of self-efficacy were reported when individuals were assigned a specific difficult goal and encouragement was present. Hypothesis 5b is therefore partially supported, as optimists assigned a specific difficult goal and given encouragement did have higher levels of self-efficacy than other conditions, but those high in defensive pessimism scored higher levels of self-efficacy when they were assigned a specific difficult goal than when they were assigned a do-your-best goal.

Figure 13

*Three-way Interaction on Self-Efficacy*

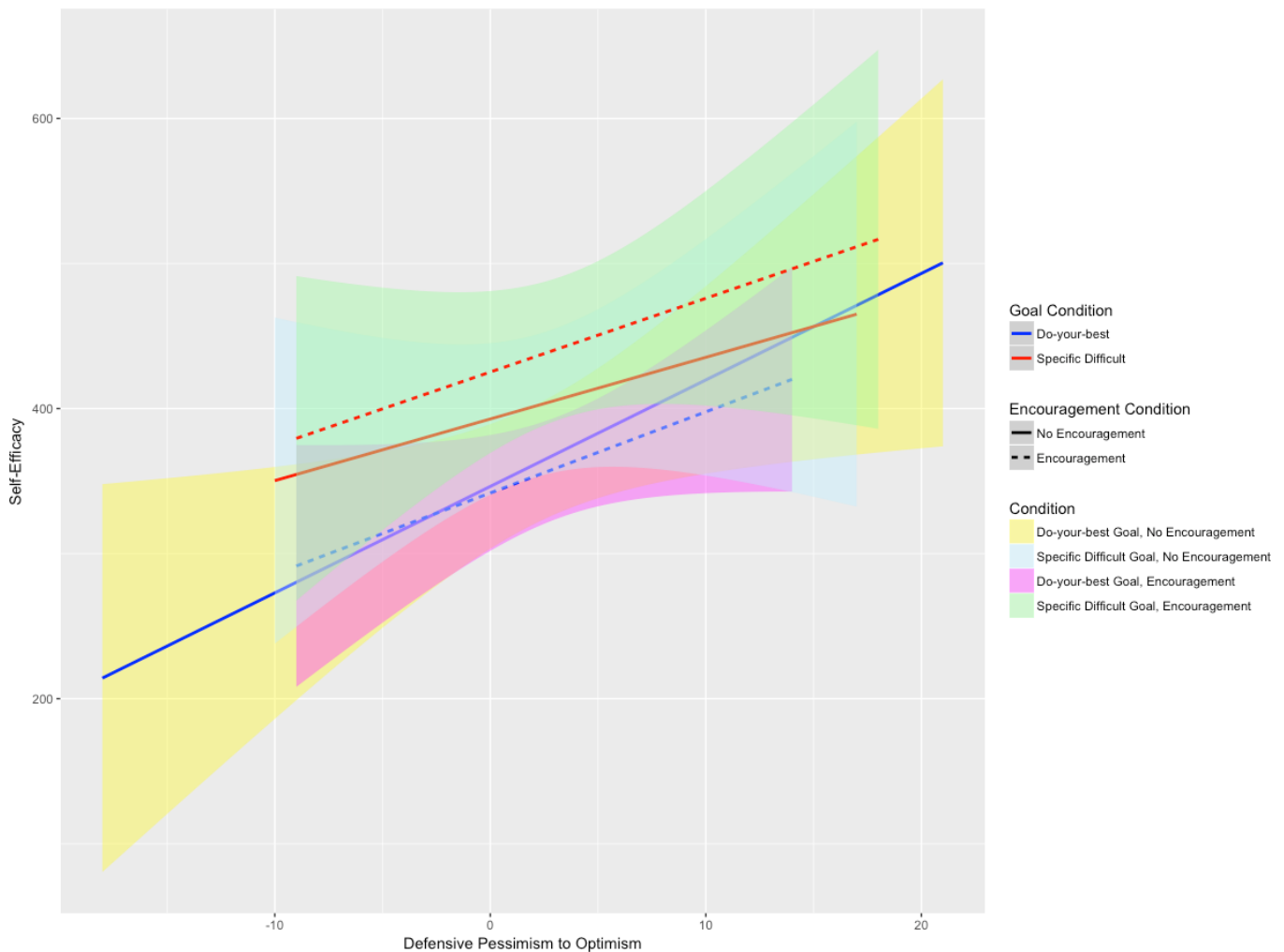


Table 24 shows predicted self-efficacy scores and the standard error of prediction for different goal and encouragement conditions. The predicted self-efficacy scores are calculated for three levels of optimism-defensive pessimism, which include what will be called a stereotypical “defensive pessimist”, with a score that is two standard deviations below the mean on optimism-defensive pessimism (-3.41), an individual who is considered “average” due to a mean score on optimism-defensive pessimism (2.63), and an individual who is considered a stereotypical “optimist”, with a score that is two standard deviations above the mean on optimism-defensive pessimism (8.66). The four conditions for prediction are as follows: do-your-best goal and no encouragement, do-your-best goal and encouragement, specific difficult goal and no encouragement, specific difficult goal and encouragement. All of the conditions assume mean levels of positive affect, negative affect, and goal commitment.

Table 24

*Self-Efficacy Predictions for Different Conditions*

	Defensive Pessimist Prediction (Confidence Interval)	Average Prediction (Confidence Interval)	Optimist Prediction (Confidence Interval)
Do-your-best Goal No Encouragement	-55.98 (-368.00, 256.05)	-39.81 (-350.14, 270.53)	-23.64 (-336.31, 289.03)
Do-your-best Goal Encouragement	-50.75 (-364.80, 263.30)	-39.12 (-349.80, 271.57)	-27.49 (-340.76, 285.79)
Specific Difficult Goal No Encouragement	30.72 (-282.51, 343.95)	19.45 (-291.33, 330.24)	8.18 (-305.82, 322.17)
Specific Difficult Goal Encouragement	62.95 (-250.82, 376.71)	64.08 (-246.52, 374.68)	65.21 (-247.40, 377.82)

These exemplars show that across individuals and conditions, the highest levels of self-efficacy are reported when individuals are assigned a specific difficult goal and given

encouragement. Being assigned a do-your-best goal led to the lowest levels of self-efficacy for all levels of defensive pessimism and optimism. Additionally, it appears that an individual who is a strong defensive pessimist experiences relatively high levels of self-efficacy when they are assigned a specific difficult goal but not given encouragement, while an optimist in the same condition experiences very low levels of self-efficacy. However, the strongest effect on self-efficacy was a goal condition main effect in that specific difficult goals led to higher levels of goal commitment than do-your-best goals, which carried more weight than encouragement condition or optimism-defensive pessimism.

### Longitudinal Analyses

Longitudinal effects for performance over the five time trials were investigated. Figure 14 shows a plot of the regression lines for each of the 256 participants over the five time trials. Additionally, Figure 15 shows a similar plot, but allows for time effects within individuals.

Figure 14

#### *Participant Performance Over Time*

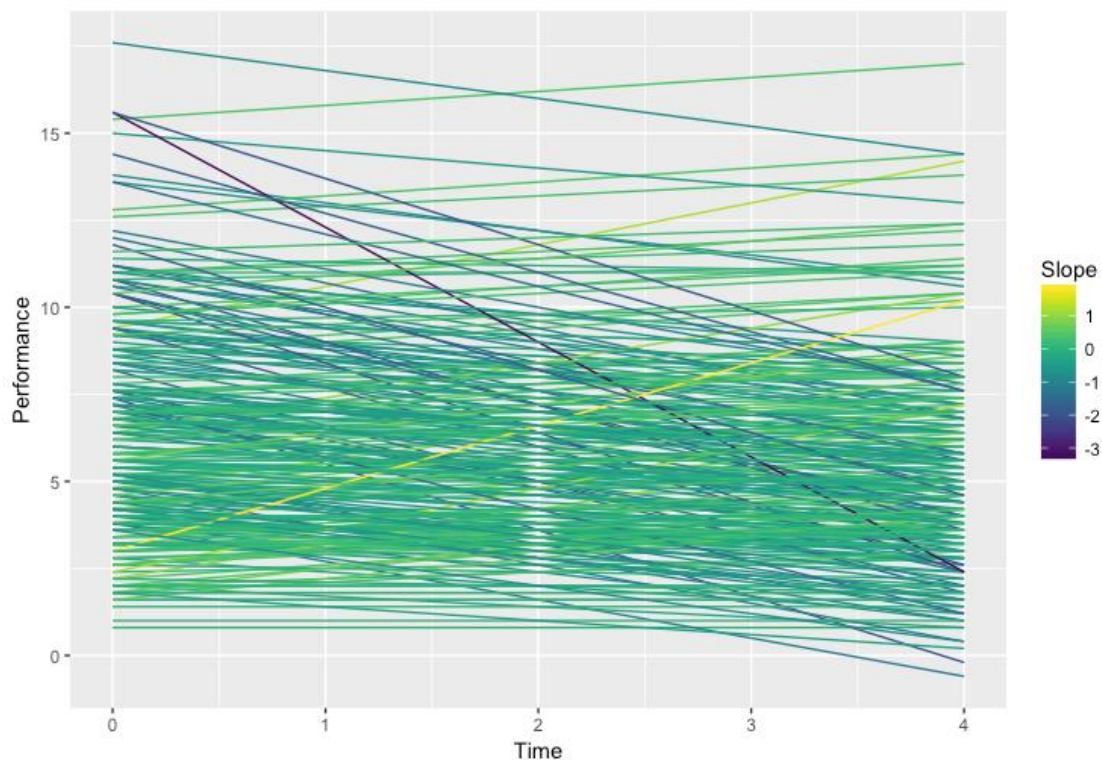
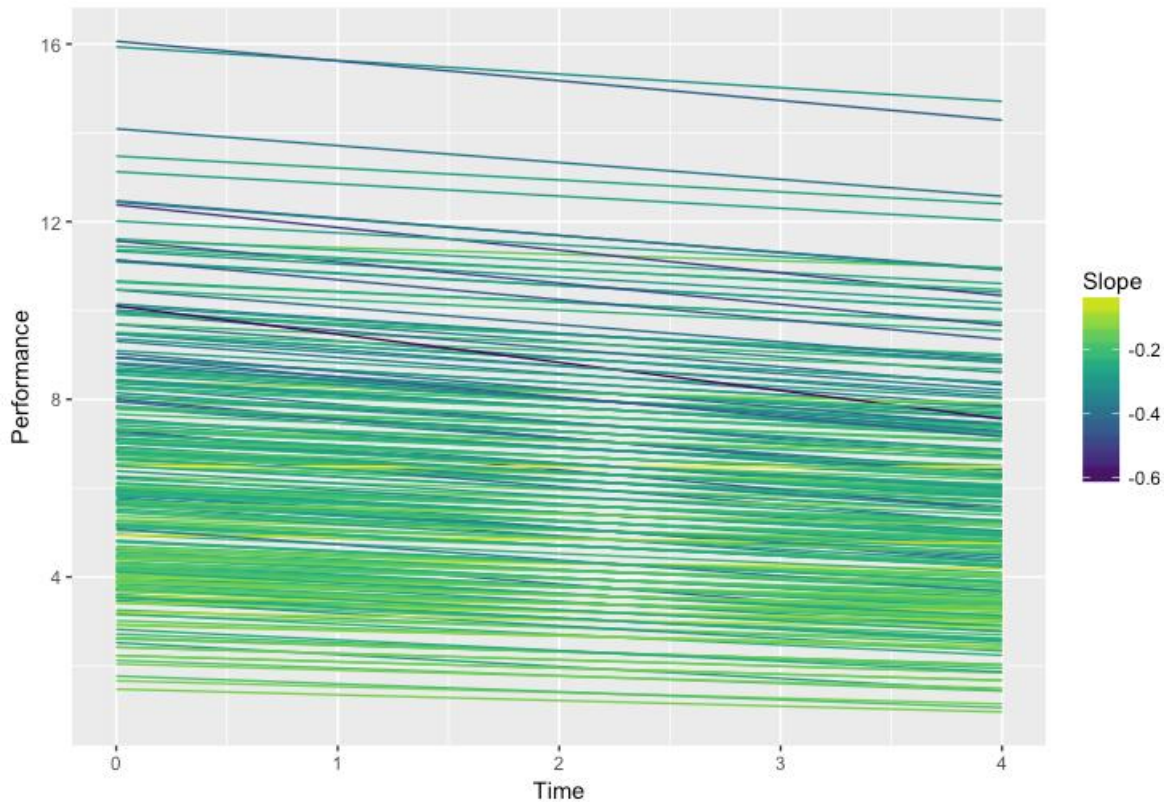


Figure 15

*Participant Performance Over Time Controlling for Variables*

Hypothesis 6 predicted that over several trials, defensive pessimists will adjust to the manipulations of goal assignment and encouragement, and will perform at higher levels. Overall, performance declined over time, regardless of an individual's score on the optimism-defensive pessimism scale, so this hypothesis was not supported. Hierarchical linear modeling was used to test longitudinal effects, utilizing full maximum likelihood estimation in order to compare nested models regardless of whether they differed in random or fixed effects. The Level 1 intraclass correlation value was calculated to determine the relative amount of variance in the study variables lying between- and within-individuals based on an unconditional random coefficient model, and it was found that 67.19% of the variability in performance could be explained by the individual.

The first model created was an unconditional means model, modeling average performance and how different each individual scored from the mean, and from their own average on each particular round. The second model created was an unconditional growth model which added in the time index as a predictor. A pseudo R-squared was calculated, and the marginal R-squared showed that 0.98% of the variance in performance was explained by the fixed effects, and the conditional R-squared revealed that 69.35% of the variance in performance was explained by both the fixed and random factors, which suggests that adding in the time variable did not reduce overall within-person variation by a great amount. Utilizing a likelihood ratio test to compare the two models, it was determined Model 2 provided a significantly better fit than Model 1 ( $\chi^2(3, N = 256) = 41.68, p < .001$ ).

Next, conditional models were created. Model 3 added in the centered control variables (i.e., positive affect, negative affect, goal commitment, and self-efficacy). Model 4 added in the focal variables for the main effects (i.e., goal condition, encouragement condition, and optimism-defensive pessimism). A likelihood ratio test comparing Model 4 with Model 3 showed that Model 4 fit significantly better than Model 3 ( $\chi^2(3, N = 256) = 8.02, p = .046$ ). Model 5 added in interaction variables between time and each of the focal variables, but did not fit the data statistically significantly better than Model 4 ( $\chi^2(3, N = 256) = 3.00, p = .39$ ). Model 6 added in two-way interactions between the focal predictors (i.e., goal condition x encouragement condition, goal condition x optimism-defensive pessimism, and encouragement condition x optimism-defensive pessimism). Model 6 improved fit significantly better than Model 5 ( $\chi^2(3, N = 256) = 8.84, p = .03$ ). Model 7 added in three-way interactions between time and each of the two-way interactions from Model 6, which did not improve fit significantly more ( $\chi^2(3, N = 256) = 0.84, p = .84$ ). Model 8 added in the three-way interaction between goal condition,

encouragement condition, and optimism-defensive pessimism, though this model was not a significantly better fit than Model 7 ( $\chi^2(1, N = 256) = 1.01, p = .32$ ). Lastly, Model 9 added in a four-way interaction between time and all of the focal predictors. Table 22 shows the intercept fixed effects results from the models. The likelihood ratio test between Model 9 and Model 8 showed that Model 9 did not significantly improve the fit over Model 8 ( $\chi^2(1, N = 256) = .0004, p = 0.98$ ). The Fixed Effects results comparing Models 1-9 are in Table 25. The random effects resulting from the nine regression models are displayed in Table 26.

Table 26 shows that the intercept variance, slope variance, residual variance, and correlation between the intercepts and slopes did not vary greatly between models. The interaction between goal condition, and encouragement condition over time on predicted performance from Model 9 for a score one standard deviation above the mean on optimism-defensive pessimism (Optimist) and one standard deviation below the mean on optimism-defensive pessimism (Defensive Pessimist) is shown in Figures 16a and 16b. As Figure 16a shows, an individual with a score one standard deviation above the mean on optimism-defensive pessimism is predicted to perform at the highest levels with encouragement over time. Additionally, using the hierarchical regression model, it is predicted that this individual's scores would decrease over time for all conditions with the exception of the do-your-best goal and encouragement condition, in which scores are predicted to increase over the trials.

As Figure 16b shows, an individual with a score one standard deviation below the mean on optimism-defensive pessimism is predicted to perform at the highest levels with a specific difficult goal but no encouragement over time. Additionally, scores for this individual are

Table 25

#### *Longitudinal Fixed Effects Results*

Estimate (SE)	Model								
	1	2	3	4	5	6	7	8	9
Intercept	5.89 (0.18)	6.35 (0.20)	5.92 (0.17)	5.44 (0.26)	5.44 (0.29)	5.30 (0.32)	5.34 (0.33)	5.30 (0.33)	5.30 (0.33)
Time		-0.23 (0.04)	-0.12 (0.04)	-0.12 (0.04)	-0.12 (0.07)	-0.12 (0.07)	-0.14 (0.08)	-0.14 (0.08)	-0.14 (0.08)
Positive Affect			-0.04 (0.01)	-0.04 (0.01)	-0.03 (0.01)	-0.03 (0.01)	-0.03 (0.01)	-0.03 (0.01)	-0.03 (0.01)
Negative Affect			-0.04 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
Self-Efficacy			0.01 (0.001)	0.01 (0.001)	0.01 (0.001)	0.01 (0.001)	0.01 (0.001)	0.01 (0.001)	0.01 (0.001)
Goal Commitment			0.19 (0.13)	0.20 (0.13)	0.20 (0.13)	0.21 (0.13)	0.22 (0.13)	0.22 (0.13)	0.22 (0.13)
Goal Condition				0.40 (0.30)	0.50 (0.34)	1.03 (0.45)	0.90 (0.49)	1.00 (0.50)	1.00 (0.50)
Encourage Condition				0.30 (0.29)	0.33 (0.34)	0.33 (0.45)	0.28 (0.49)	0.41 (0.50)	0.40 (0.51)
OptDP				0.05 (0.03)	0.03 (0.03)	0.03 (0.04)	0.03 (0.04)	0.05 (0.05)	0.05 (0.05)
Time: Goal					-0.04 (0.08)	-0.04 (0.08)	0.01 (0.12)	0.02 (0.12)	0.02 (0.12)
Time: Encourage					-0.01 (0.08)	-0.01 (0.08)	0.01 (0.12)	0.01 (0.12)	0.01 (0.12)
Time: OptDP					0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Goal: Encourage						-0.55 (0.57)	-0.34 (0.67)	-0.60 (0.72)	-0.60 (0.74)
Goal: OptDP						-0.10 (0.05)	-0.10 (0.06)	-0.14 (0.07)	-0.13 (0.08)
Encourage: OptDP						0.10 (0.05)	0.08 (0.06)	0.04 (0.07)	0.04 (0.08)
Time:Goal: Encourage							-0.10 (0.16)	-0.10 (0.16)	-0.10 (0.17)
Time:Goal: OptDP							-0.004 (0.01)	-0.004 (0.01)	-0.004 (0.02)
Time:OptDP Encourage							0.01 (0.01)	0.01 (0.01)	0.01 (0.02)
Goal: OptDP: Encourage:								0.10 (0.10)	0.10 (0.11)
Time: Goal: OptDP:									0.001 (0.03)
Encourage:									

Note. ":" indicates an interaction

SE indicates the standard error.

OptDP represents the optimism-defensive pessimism factor.

*Goal represents the goal condition.  
Encourage represents the encouragement condition.*

Table 26

*Random Effects Results*

	Model								
	1	2	3	4	5	6	7	8	9
Intercept	7.27	8.02	4.90	4.82	4.80	4.67	4.66	4.65	4.65
Variance									
Slope	-	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Variance									
Residual	3.56	3.32	2.92	2.91	2.90	2.91	2.91	2.90	2.90
Variance									
Correlation	-	-0.37	-0.33	-0.35	-0.35	-0.39	-0.38	-0.38	-0.38

*Note. Correlation is the correlation between the intercepts and slopes.*

Figure 16a

*Predicted Performance for Optimists Over Time*

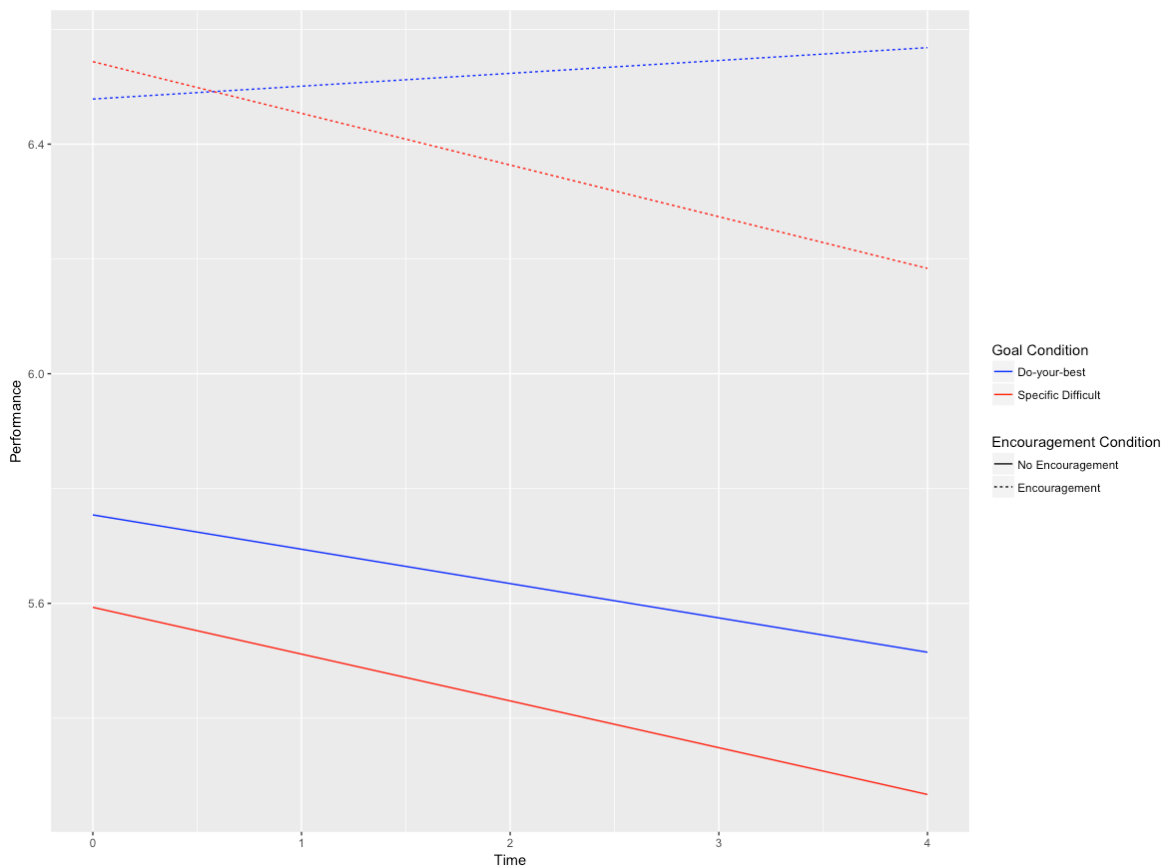
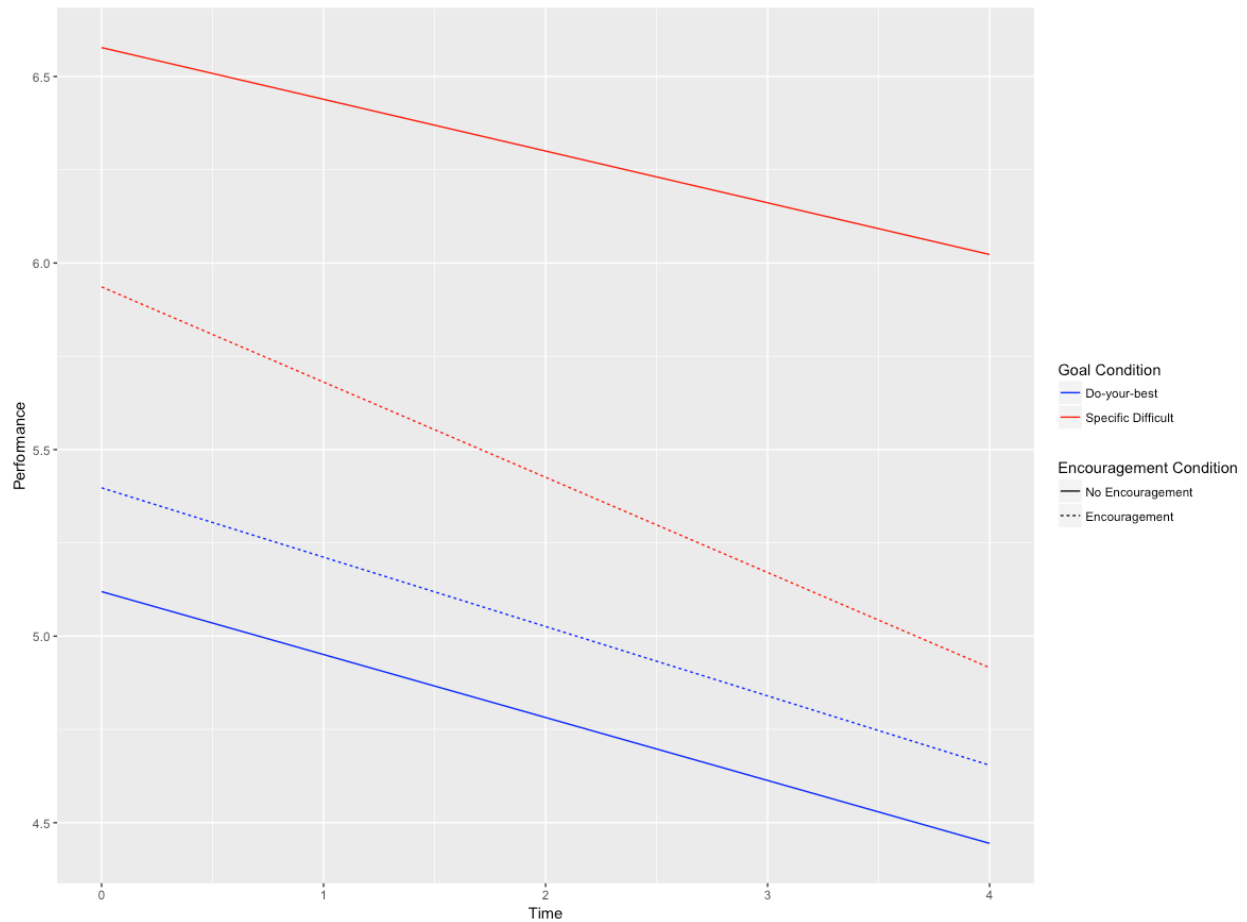




Figure 16b

*Predicted Performance for Defensive Pessimists Over Time*

predicted to decrease over trials in all conditions, but would decline at the smallest rates in the specific difficult goal and no encouragement condition.

### Discussion

The purpose of this study was to investigate the differences between optimists (i.e., individuals who view previous performance as positive and hold positive expectations for future performance) and defensive pessimists (i.e., individuals who view previous performance as positive but hold negative expectations for future performance) when they are presented with

both goals and encouragement. The theoretical contribution of this study was connecting research on optimism and defensive pessimism with goal setting research. Overall, the results suggest goal setting is effective with both strategies (i.e., optimism and defensive pessimism) but caution is warranted when considering whether or not to provide encouragement as this may adversely affect the performance of individuals utilizing a defensive pessimism strategy. This study also contributes to the goal setting research in that issues around encouragement have largely not been studied. Lastly, this research contributes to the defensive pessimism literature which in the past, has dichotomized individuals as defensive pessimists or optimists using a continuous measure, and this study allowed for analysis for this variable as continuous which sheds light onto the performance outcomes of individuals who fall towards the middle of the measure.

### **Performance**

Goal setting literature posits that individuals who have specific difficult goals will outperform those who have a do-your-best goal, and the presence of encouragement will improve performance (Locke & Latham, 2002; Locke et al., 1981). Research has found that individuals who utilize a defensive pessimism strategy (i.e., expecting poor performance for the future despite positive performance in the past) perform just as well as individuals who utilize an optimism strategy (i.e., expecting positive performance for the future while viewing past performance as positive as well), unless encouragement is present, which blocks the defensive pessimism strategy, leads to unharnessed stress, and hinders performance for these individuals (Norem & Cantor, 1986a, 1986b).

To investigate these effects, two forms of hierarchical linear regression modeling were done to investigate the differences goal and encouragement manipulations had on different

individuals. The first set of models showed the total effect of the primary independent variables. The first model contained just the control variables (i.e., positive affect, negative affect, goal commitment, self-efficacy). The second model added in the focal predictors (i.e., goal condition, encouragement condition, optimism-defensive pessimism). The third model contained all of the variables from the previous models and added in interactions between the focal predictors (i.e., goal condition x encouragement condition, goal condition x optimism-defensive pessimism, encouragement condition x optimism-defensive pessimism). Lastly, the fourth model included all of the terms from the three previous models and added in a three-way interaction term between goal condition, encouragement condition, and optimism-defensive pessimism.

In the second set of regression models, known mediators between goals and performance affecting self-regulation processes (i.e., positive affect, negative affect, goal commitment, and self-efficacy) were controlled for and incorporated in all of models. Thus, model 1 included just these control variables, model 2 added in the primary independent variables (goal condition, encouragement condition, and optimism-defensive pessimism), model 3 included all of the variables from the previous model with the addition of the two-way interactions between the primary independent variables, and model 4 added in the three-way interaction between the primary independent variables.

With performance as the primary dependent variable, this final model, considered the theory of motivation for this study, accounted for 40.51% of the variance in performance. Overall, individuals who were more likely to utilize an optimistic strategy had higher levels of performance than those who were more likely to utilize a defensive pessimism strategy. Individuals higher in optimism saw a significant performance improvement when they were assigned a specific difficult goal and given encouragement. Individuals who were more

defensively pessimistic performed better with specific difficult goals than do-your-best goals, but the presence of encouragement severely hindered the performance levels for those higher in defensive pessimism. As individuals increased in the likelihood of utilizing an optimistic strategy, the presence of encouragement facilitated higher levels of performance. This suggests that overall, specific difficult goals are helpful to both strategies, but if encouragement is present, the positive effects of difficult goals may be blocked for those utilizing a defensive pessimism strategy. This aligns with previous research on both goal setting and defensive pessimism, as the assignment of specific difficult goals improves the performance of these individuals, and the presence of encouragement hinders performance for defensive pessimists (Locke & Latham, 2002; Norem & Cantor, 1986b).

For individuals who utilize a defensive pessimism strategy, when it becomes apparent that they are unlikely to achieve the goal set for them, this aligns with their beliefs and they can continue performing as they normally would. However, when encouragement is present for these same individuals, this disrupts the low expectations consistent with the defensive pessimism strategy and the realization of their inability to achieve the desired goal leads to increased negative affect which ultimately negatively impacts performance, which aligns with defensive pessimism research (Norem & Cantor, 1986a, 1986b). For optimists, the presence of encouragement was found to significantly improve performance. This could mean that as an individual with an optimistic strategy realizes they may be unable to achieve their goal, the presence of encouragement offsets a rate of progress that is unlikely to result in goal attainment. For individuals who are more likely to take on a defensive pessimistic strategy, the presence of encouragement may block the cognitive strategy of setting low expectations, preventing these individuals from performing at high levels. Additionally, there was a significant main effect for

the goals condition in that the presence of specific difficult goals led to higher levels of performance than do-your-best goals. However, for an individual more likely to take a defensive pessimism strategy, if encouragement was present, a do-your-best goal actually led to higher levels of performance than a specific difficult goal. This could be that in a do-your-best goal condition, individuals have control over what to set the goal as and adding encouragement to what they are doing (even if it was a very low self-set goal) does not hinder performance in this case.

Ultimately, for individuals more likely to utilize a defensive pessimism strategy, no encouragement and a specific difficult goal led to the highest levels of performance. For individuals more likely to utilize an optimistic strategy, the presence of encouragement led to higher levels of performance than when encouragement was not present, and specific difficult goals were superior to do your-best goals. Though it was unclear how specific difficult or do-your-best goals would impact the defensive pessimism strategy as this had not been previously studied, goal setting theory is shown to be a prevailing force across cognitive strategies to the extent that encouragement is absent for those with a defensive pessimism strategy, despite the positive effects it has for the optimism strategy. Thus, the goal setting literature supports the positive influence of specific difficult goals on performance, while the defensive pessimism literature restrains the positive effects of encouragement to only those individuals who utilize an optimism strategy as opposed to a defensive pessimism strategy (Locke & Latham, 1990; Norem & Cantor, 1986b).

This has significant practical implications as it suggests that the same motivational tactics may have different influences on individuals depending on how the cognitive strategy they utilize, defensive pessimism or optimism. While the presence of specific and difficult goals in

general tends to aid performance, for individuals more likely to utilize a defensive pessimism strategy, including encouragement boosts performance further for individuals who are more optimistic, but severely hinders the positive effect of specific difficult goals for individuals who are more defensively pessimistic. This three-way interact between goals, encouragement, and cognitive strategy on performance needs to be considered in practical settings in order to fully motivate employees in the workplace. For example, a manager in an organization who wants to motivate employees to perform at higher levels should utilize goal setting theory in ensuring employees have specific difficult goals, but should also be aware of their employees' cognitive strategy in regards to the task at hand, as adding encouragement to the specific difficult goal can severely hinder or enhance performance of those utilizing a defensive pessimism strategy versus an optimism strategy, respectively.

### **Positive Affect**

Previous studies of defensive pessimism have not directly measured positive affect. Individuals who utilize a defensive pessimistic strategy tend to have lower expectations of their future performance, which may be reflected in lower levels of positive affect (Norem, 2001). On the other hand, individuals who utilize an optimistic strategy tend to have higher expectations of future performance, which may be reflected in higher levels of positive affect (Norem, 2001). Positive affect reflects the extent to which a person feels enthusiastic and alert, but it is unclear whether individuals who utilize a defensive pessimism would both experience and report these emotions (Norem, 2001; Watson, Clark, & Tellegen, 1988b).

The multiple regression models predicting positive affect found that the fourth model encompassing all of the variables as well as the two and three-way interactions accounted for 26.51% of the variance in positive affect. As optimism scores across individuals was increased,

positive affect increased as well. The lowest levels of positive affect came from those high in defensive pessimism with a specific difficult goal but not encouragement, which was also the condition which yielded the highest levels of positive affect for those high in optimism. Despite the low levels of positive affect experienced by those high in defensive pessimism in the specific difficult goal and no encouragement condition, this condition yielded the highest performance levels for these individuals, suggesting that these individuals may perform better on lower levels of positive affect. Those higher in optimism experienced more positive affect when they did not receive encouragement than when they did, even though they performed better when they received encouragement than when they did not. Previous literature has not examined the extent to which cognitive strategy correlated with positive affect, but these findings show that higher positive affect does not necessarily correlate with higher levels of performance.

### **Negative Affect**

Defensive pessimism literature has not directly measured negative affect, but the defensive pessimism strategy is associated with high levels of stress, so individuals utilizing this strategy would be likely to show high levels of negative affect (Norem & Cantor, 1986b; Watson et al., 1988b). Individuals utilizing an optimistic strategy have been shown to have lower levels of anxiety than individuals utilizing a defensive pessimistic strategy (Cantor & Norem, 1989). Additionally, high levels of negative affect has been shown to lead to poor levels of performance (Kaplan, Bradley, Luchman, & Haynes, 2009).

The hierarchical multiple regression analyses on negative affect found that the model including all control variables, focal variables, two-way interactions, and three-way interactions accounted for 15.68% of the variance in negative affect. Overall, individuals higher in defensive pessimism were found to have higher levels of negative affect than optimists. This aligns with

previous research on defensive pessimism which states that a primary characteristic of defensive pessimists is that they have high levels of anxiety, which is one aspect of negative affect (Norem & Illingworth, 2004). In goal setting research, negative affect is associated with poor performance (Kaplan et al., 2009). If defensive pessimists are unable to harness their high levels of anxiety, it results in impaired performance. In this study, individuals high in defensive pessimism in the do-your-best goal and no encouragement condition, and those in the specific difficult goal and encouragement condition had the highest levels of negative affect, which were also the conditions these individuals performed the most poorly in, which aligns with this research. It was also found that negative affect increased over time in individuals high in defensive pessimism, but not in individuals high in optimism, which could contribute to the fact those higher in optimism ultimately outperformed those higher in defensive pessimism.

It is interesting to note that the presence of encouragement did not inevitably lead to high levels of negative affect and low levels of performance for individuals high in defensive pessimism: defensive pessimists who were encouraged but were in the do-your-best goal condition had low levels of negative affect and were able to perform well. Thus, it appears that the presence of encouragement in and of itself does not necessarily lead to low levels of performance, but rather when it is combined with specific difficult goals, it may have adverse effects for defensive pessimists. Conversely, when defensive pessimists were assigned a specific difficult goal, they were able to continue performing at high levels with maintaining low levels of negative affect, as long as they were not given encouragement. The combination of encouragement and goals has not previously been directly looked at in either the defensive pessimism or goal setting literature, so this study shows some of the constraints on the theories positing that encouragement for defensive pessimists is universally a negative influence.



### **Goal Commitment**

Research on goal commitment has shown that the relationship between goal commitment and performance is stronger for difficult relative to easy goals (Klein et al., 1999). The construct of goal commitment has not been directly measured in cognitive strategy research, but individuals utilizing either a defensive pessimism or an optimism strategy demonstrate high levels of goal commitment by focusing their mental resources on the task at hand, though those utilizing a defensive pessimist strategy may not acknowledge it in a self-reported measure of goal commitment.

The regression analyses for goal commitment found that the model containing all of the control and predictor variables and all possible interactions between the predictor variables explained 32.00% of the variance in goal commitment. Overall, as optimism scores increased, goal commitment scores also increased. Results also showed that when individuals were assigned a specific difficult goal, they had lower levels of goal commitment than when they received a do-your-best goal, which does align with previous studies (Klein et al., 1999). This effect increased in strength as the individuals were more defensively pessimistic. Additionally, the lack of encouragement tended to lead to higher levels of goal commitment than when encouragement was present across the defensive pessimism/optimism spectrum. Goal commitment has not been studied in the defensive pessimism literature, so it was unclear how defensive pessimists would self-report their levels of goal commitment. Results show that those higher in defensive pessimism stated that they were less committed to their goals than optimists, but these scores did not align with the pattern of performance scores across all the conditions for defensive pessimists. As a result, it is likely that goal commitment may be less important for defensive pessimists, even though they still strive for goal attainment.

**Self-Efficacy**

Although the self-efficacy of defensive pessimists has not been studied directly, since it is defined as one's belief in their ability to successfully achieve a goal, and defensive pessimists intentionally expect low levels of performance, it was expected that these individuals would have overall lower levels of self-efficacy (Bandura, 1986; Norem & Cantor, 1986a). Results of the hierarchical regression analyses showed that the model containing all control and focal predictors, as well as all two and three-way interactions between the focal predictors accounted for 27.17% of the variance in self-efficacy. As individuals were more optimistic, they attained higher levels of self-efficacy. Additionally, individuals in the do-your-best goal condition had lower levels of self-efficacy than individuals in the specific difficult goal condition across the optimism-defensive pessimism spectrum. Researchers posit that specific goals promote self-efficacy because progress is easy to gauge (Schunk, 1990).

In this study, goal attainment was rarely achieved so it is unlikely that high levels of self-efficacy would be maintained across all trials. However, the way self-efficacy was measured (i.e., summing the certainty an individual reported in his/her own ability to list 2, 4, 6, 8, 10, 12, 14, and 16 uses) may have resulted in inflated self-efficacy scores, as individuals may have been extremely confident in their abilities to come up with at least 6-8 uses, thereby exaggerating self-efficacy scores. Additionally, it is possible that individuals were unaware of how many uses they came up with on previous trials, as they only had 2 minutes per trial to report as many uses as possible, so those given a specific goal may have thought they were close to attainment, whereas those with a do-your-best goal may not have had any idea about how they were doing, and this lack of activated self-evaluations from the general goal may have led to lower levels of self-efficacy (Schunk, 1990).

For all optimism-defensive pessimism scores, the condition that led to the highest levels of self-efficacy was the specific difficult goal and encouragement condition. Over time, self-efficacy scores decreased for both optimists and defensive pessimists and across all the goal and encouragement manipulations, which does contrast with previous literature on creative self-efficacy over time, although this could be due to the short duration of the entire study and short intervals between time trials (Tierney & Farmer, 2011). Additionally, individuals likely came into the study with preexisting levels of self-efficacy toward creative tasks, and since it takes experiences of mastery to adequately influence self-efficacy, their self-efficacy may not have changed as a result of the encouragement manipulation. Also, participants may not have believed they performed well even when they were told performed at high levels, or their preexisting levels of self-efficacy towards creative tasks were too strong to be changed in the short study (Bandura, 1977).

### **Longitudinal Effects**

Though the practice effect suggests that performance should increase over time, this was not found to be true in this study, regardless of optimism-defensive pessimism scores, as overall, performance increased from Time 1 to Time 2, but then decreased consistently onwards (Hausknecht et al., 2007). This could be due to boredom, mental fatigue, or the increasing levels of negative affect exhibited by defensive pessimists, all of which have been shown to result in decreasing levels of performance (Geiwitz, 1966; Langner, Steinborn, Chatterjee, Sturm, & Willmes, 2010; Kaplan et al., 2009). The most plausible explanation for the poor performance scores for individuals as time went on was boredom and negative emotions resulting from the tedious nature of the study. Some participants exhibited boredom in their responses. For example, in response to generating creative uses for a plastic drinking cup, one participant wrote

“Drinking away my feelings after all these questions”. This shows that participants found the repetitive nature of the study to be too long and too boring, and may indicate that they did not find the incentives to be worth the amount of work the study required.

Predictions for individuals who were more optimistic (one standard deviation above the mean on optimism-defensive pessimism), showed that over time, individuals in the specific and difficult goal and encouragement, the do-your-best goal and no encouragement, and the specific difficult goal and no encouragement conditions would have decreased performance over time, yet individuals with this optimism score in the do-your-best goal and encouragement condition would be predicted to have a slight increase in performance over time. This does conflict with goal setting literature which posits that the presence of specific difficult goals improves performance over time, but it is possible that by not adjusting the goal according to performance, these individuals are able to tell they are not performing up to the goal standards so they lose goal commitment and their self-efficacy is decreased over time, which is evidenced in the data (Locke & Latham, 2002). Additionally, the repetitive nature of the task may have overpowered goal commitment in this study, as respondents did report boredom.

Predictions for individuals who were more defensive pessimistic (one standard deviation below the mean on optimism-defensive pessimism), showed that over time, performance was expected to decrease for these individuals. Performance was predicted to decline at the slowest rate for defensive pessimists in the specific difficult goal and no encouragement condition, with this condition yielding the highest performance scores for these individuals as well. Defensive pessimists with do-your-best goals were predicted to perform the worst, which was a trend that was predicted to continue over time.

These predictions have practical implications as well. They show the importance of self-efficacy and goal commitment, especially in repetitive tasks, which is true for both optimists and defensive pessimists. Additionally, individuals who are more optimistic may perform slightly better as time goes on if they are given a do-your-best goal and encouragement for a creative task. However, caution is warranted because individuals who are more defensively pessimistic would be expected to perform worse as time goes on with those same conditions, so managers should not provide encouragement and do-your-best goals universally across all employees.

### **Summary**

Overall, this study demonstrates the importance of difficult and specific goals in achieving high levels of performance. Individuals high in defensive pessimism, who go into situations expecting negative outcomes despite high levels of previous performance typically do not perform well when they are encouraged, as this blocks their mental strategy. This study found that defensive pessimists view goals differently than encouragement, and when they are assigned specific difficult goals, they tend to perform the same if not better than when they are told to do their best. However, receiving both difficult goals and encouragement resulted in a negative interaction for these individuals, and they ended up performing worse than they might have otherwise. This suggests that leaders should focus primarily on making sure employees have difficult and specific goals set over offering encouragement in order to enhance their performance.

### **Limitations**

This study had several limitations. The first limitation was that this study was conducted on Amazon MTurk instead of in-person. Previous studies on defensive pessimism were conducted in-person which may have made the encouragement manipulations more salient

(Norem & Cantor, 1986a, 1986b). It is possible that online participants did not read as thoroughly, and therefore missed or were influenced less by manipulations. The combination of the online nature of the study with little incentive to achieve high levels of performance may have resulted in less anxiety experienced by individuals than they might feel in the context of their daily lives, so they may not have needed to employ the defensive pessimism strategy as much or at all.

The encouragement manipulation check was not supported. One reason for this could be that it is a result of participants not paying attention. Checks were put in place to ensure participants were paying attention, and data from participants who failed the attention checks were not used, which helps alleviate this issue. Another reason the manipulation check may have failed could be a result of the nature of the measure, as it was self-report and asked the extent to which participants felt like they had pressure or expectations imposed upon them. Participants may not have consciously viewed the encouragement as expectations and pressure, even if it did affect them this way, so they may not have reported it in the self-report measure. The encouragement manipulation did interact with the other variables so participants may have not been aware of the impact it had. Also, the encouragement manipulation check measure yielded only a moderate internal reliability score, which indicates that the items themselves were not highly correlated, showing that the measure used for the encouragement manipulation check itself was not ideal.

Next, instead of following previous research and labeling participants in a top percentile of the optimism- defensive pessimism scale as optimists, and the participants in a bottom percentile of the scale as defensive pessimists and throwing out the data of those who fell in the middle, all the data were retained, and a hierarchical multiple regression was conducted in order

to keep optimism-defensive pessimism as one continuous variable, with high scores indicating the individual would be more likely to utilize an optimism strategy, and low scores indicating the individual is more likely to utilize a defensive pessimism strategy. (Norem, 2001). Although this analysis is considered a strength of this study, it has potential implications for directly comparing the results with previous defensive pessimism literature, as there was no direct dichotomization between defensive pessimism and optimism. However, the fact that information was retained for individuals only slightly leaning toward one side of the scale provides more comprehensive information.

This study found that performance on the creative generation tasks decreased over time, which may be due to the fact that participants grew more irritated with the seemingly redundant study over time. Participants did not appear to be incentivized enough for the amount of time the study took, and thus lost interest and commitment to the task at hand. This same trend may not have occurred had individuals been more engaged in the study.

### **Future Directions**

In this study, it was interesting to find that encouragement only truly disrupted the defensive pessimism strategy when individuals were also assigned specific difficult goals, while the presence of these specific difficult goals without encouragement led to the highest levels of performance. Future studies might examine this interaction further, and investigate what it is about the presence of both difficult goals and encouragement that leads to the disruption of the defensive pessimism strategy, and why individuals more likely to utilize a defensive pessimism strategy who are given encouragement and a do-your-best goal do not have their performance as impaired as when they are assigned a specific difficult goal.

Future researchers should also consider replicating this study in-person as opposed to online to see if similar effects are found, as in-person studies might make the manipulations more salient. This could also help by potentially increasing participant engagement in the study. Also, better incentivizing participants so that they have increased focus and commitment to the task may replicate reality better which may lead to more generalizable results.

### **Conclusion**

This study aimed to understand the differences in performance, negative and positive affect, self-efficacy, and goal commitment between individuals varying in their level of optimism and defensive pessimism in different goal and encouragement manipulations. Overall, individuals more likely to utilize a defensive pessimism strategy performed the best when they were assigned specific difficult goals but not given encouragement, and they performed almost as well when they were given a do-your-best goal and encouragement. However, these individuals performed the worst when they were both assigned a difficult goal and given encouragement. Individuals more likely to utilize an optimism strategy, on the other hand, performed the best when they were assigned a specific difficult goal and given encouragement. The more likely an individual was to utilize a defensively pessimism strategy, the higher levels of negative affect they reported, and negative affect increased as time went on. Levels of negative affect also correlated with performance, in that performance was highest in the conditions in which negative affect was the lowest, and performance was the lowest in the conditions in which performance was the highest. Individuals more likely to utilize an optimism strategy also tended to have higher levels of positive affect, goal commitment, and self-efficacy than those more likely to utilize a defensive pessimism strategy. Overall, individuals in the do-your-best goal condition had higher levels of goal commitment than individuals in the specific



difficult goal condition, but in general, the higher the goal commitment, the better the performance.

This study contributes to defensive pessimism literature by adding the construct of goals, showing that specific difficult goals can have a positive impact on individuals utilizing a defensive pessimism strategy so long as the strategy is not interfered with by encouragement. Additionally, by utilizing defensive pessimism and optimism as a continuous variable without removing data, this study allows for these constructs to be studied over the continuum, which has not previously been studied in this literature in this manner. This study contributes to the goal setting research by applying restraints to goal setting theory in the form of the interaction between goals, cognitive strategies, and encouragement, as in different situations, specific difficult goals may not always lead to the highest levels of performance. Results mostly align with previous defensive pessimism literature by showing that the presence of encouragement blocks the defensive pessimism strategy but enhances the performance for individuals in the optimistic strategy (Norem & Cantor, 1986b). This study adds in the positive impact of assigned specific difficult goals for overall improved scores for defensive pessimists when encouragement is absent. The positive influence of specific difficult goals for individuals utilizing either an optimism or a defensive pessimism strategy reflects Industrial-Organizational Psychology literature, showing that goals lead to improved performance (Locke, 1980; Locke & Latham, 2002). Practitioners can benefit from this study as well, as results support the use of goal setting theory, and may help leaders understand why encouragement does not benefit all employees universally. While encouragement and specific difficult goals may help some employees, the combination of these two constructs may do more harm than good for others, so it is important to

understand what cognitive strategy an individual is utilizing when faced with a challenge in order to best enhance the performance of that individual.

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**APPENDIX A**

Defensive Pessimism Questionnaire, derived from the Optimism-Pessimism Prescreening Questionnaire (Norem & Cantor, 1986a) and the Revised Defensive Pessimism Questionnaire (Norem, 2001).

Rating each item on a 1 (Not at all true of me) to 7 (Very true of me) Scale

Think about your behavior in creative task situations

1. I often go into creative task situations expecting the worst, even though I will probably do OK. <sup>a</sup>
2. I generally go into creative task situations with positive expectations of how I will do. <sup>b</sup>
3. I've generally done pretty well in creative task situations in the past. <sup>c</sup>
4. I often try to think about what I would do if I did very poorly in creative task situations. <sup>a</sup>
5. When I do well in creative task situations, I often feel relieved. <sup>a</sup>
6. When I do well in creative task situations, I feel really happy. <sup>b</sup>
7. Considering what can go wrong in creative task situations helps me to prepare. <sup>a</sup>
8. Prior to these creative task situations, I avoid thinking about possible bad outcomes. <sup>b</sup>
9. I often try to figure out how likely it is that I will do very well in creative task situations. <sup>b</sup>

<sup>a</sup> Items corresponding to Defensive Pessimism

<sup>b</sup> Items corresponding to Optimism

<sup>c</sup> Items corresponding to both Defensive Pessimism and Optimism

**APPENDIX B**

## Manipulation Checks

## Goal Difficulty

Rate each item on a 1 (Not at all true) to 7 (Very true) Scale

1. The performance session was difficult.
2. The goal I strove for in the creative generation task was difficult.
3. I did not find it hard to come up with the number of uses I was aiming for.
4. Achieving the number of ideas I set out to generate was an easy task.

## Encouragement

Rate each item on a 1 (Not at all true) to 7 (Very true) scale

1. I felt like I had to live up to the expectations imposed on me.
2. I did not feel any pressure to generate uses for the objects.
3. There were no expectations of my performance on this task.
4. There were high expectations for my performance during the study.

**APPENDIX C**

Self-Efficacy Scale

Certainty: (0 to 100%)

I can list 2 uses in 2 minutes

I can list 4 uses in 2 minutes

I can list 6 uses in 2 minutes

I can list 8 uses in 2 minutes

I can list 10 uses in 2 minutes

I can list 12 uses in 2 minutes

I can list 14 uses in 2 minutes

I can list 16 uses in 2 minutes

**APPENDIX D**

4-item unidimensional scale of goal commitment.

1. It's hard to take this goal seriously.
2. It's unrealistic for me to expect to reach this goal.
3. It is quite likely that this goal may need to be revised, depending on how things go.
4. Quite frankly, I don't care if I achieve this goal or not.

Subjects respond on a 5-point Likert scale anchored from strongly disagree to strongly agree.

Low score is indicative of high goal commitment

**APPENDIX E**

## The PANAS

Subjects respond on a 5-point Likert scale:

Indicate the extent to which you feel at this moment (You feel this way right now, that is, at the present moment):

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested				
2. Distressed				
3. Excited				
4. Upset				
5. Strong				
6. Guilty				
7. Scared				
8. Hostile				
9. Enthusiastic				
10. Proud				
11. Irritable				
12. Alert				
13. Ashamed				
14. Inspired				
15. Nervous				

16. Determined

17. Attentive

18. Jittery

19. Active

20. Afraid



**APPENDIX F**

Scripts

**Parts which vary by condition are indicated in bold.**

*Page 1*

Consent Form: Will be replaced with real IRB consent form

Purpose of the experiment:

To better understand the kinds of abilities necessary for creative generation tasks, and people's understanding of their abilities

What you will do in this experiment:

You will be asked to participate in six 2-minute activities followed by several questionnaires.

Time required:

The session will take approximately 15-25 minutes to complete.

Potential risks and benefits:

The risks are no more than what you would encounter in everyday life. Potential benefits include a better understanding of your creative abilities.

Payment for participation:

For successfully completing the survey you will be rewarded with the incentive listed in the invite you received to participate in this study.

**Confidentiality:**

Your participation in this study will remain confidential, and your identity will not be stored with your data.

**Contact:**

If you have questions about this study, please contact Elizabeth Gorski at [egorski1@depaul.edu](mailto:egorski1@depaul.edu).

**Agreement:**

The purpose and nature of this research have been sufficiently explained and I agree to participate in this study. I understand that I am free to withdraw at any time without incurring any penalty.

*Page 2*

In this study, you will participate in the creative generation task, in which you will be asked to generate as many NOVEL uses as possible for a common item, no matter how unconventional. Responses indicating typical uses for an item will be rejected, as what is important is your creative generation of NOVEL uses for the item only.

You will first complete a practice round to become familiar with the task before moving on to the actual task. There will be five (5) trials of the task following the practice round.

Before beginning, you will be asked to fill out several questionnaires, and it is important that you read each item carefully and answer honestly. Checks are in place to ensure attention to responses.

*Page 3***Demographics**

Gender (Male/Female)

Age (Enter Number)

Ethnicity (African American, Asian, Caucasian, Hispanic, Pacific Islander)

Occupation (Enter in Textbox)

Years of Education (Completed some high school, high school graduate, completed some college, associate degree, bachelor's degree, completed some postgraduate, master's degree, Ph.D., law or medical degree, other advanced degree beyond a Master's degree)

*Page 4*

- Revised Optimism- Pessimism Prescreening Questionnaire

*Page 5*

- PANAS

*Page 6*

- Instructional Manipulation Check

Recent studies have shown that creativity does not occur in one specific time or place. Most innovators come up with an idea only after many years of intensive labor on a subject area, and evolve theories and ideas over time. In order to facilitate our research on creativity, we are interested in knowing certain factors about you and various facets which influence your creativity. Specifically, we are interested in whether you actually take the time to read the directions; if not, then some of our manipulations that rely on changes in the instructions will be ineffective. So, in order to demonstrate that you have read the instructions, please ignore the question and click on the answer choice "zero", and then press continue to move on to the next screen.

How many hours a day do you spend on a computer or smart phone?

Zero

One

Two

Three

Four

Five or More

*Page 7*

You are now about to begin the practice round of the creative generation task. It is important that you do your best during this round. You will have 2 minutes to enter as many novel uses as possible for the item before the page will automatically advance.

*Page 8*

Generate as many NOVEL uses as possible for a BRICK.

*After 2 minutes, page will advance automatically.*

*Page 9*

Your score is being calculated.

*Page 10*

Congratulations! Based off of your results from the practice round, you are ABOVE AVERAGE for creativity!

Next, you will begin the actual test. You will again have two minutes to generate as many novel uses as possible for an item.

*Page 11*

**Goal Condition:** Your goal is to generate at least X uses in the next task. Do you accept this goal of generating X uses in two minutes? Please type in your goal before proceeding to the next page, and remember it.

**Do-your-best Condition:** You should do your best in generating uses for the item in the next task.

*Page 12*

**Encouragement Condition:** Based on your previous performance during the practice round, you are expected to do VERY WELL during the task. You should feel very confident about your performance on this task since you scored very high compared to others who have performed the task. You should have no problem **goal condition: achieving your goal. Do-your-best condition: performing well.**

**No Encouragement Condition: Nothing will be said regarding previous performance**

*Page 13*

You are about to begin the next trial, in which your task is to **Goal Condition: Generate at least X uses in the next task; Do-your-best Condition: Do your best to generate as many uses as possible in the next task.** Again, due to your ABOVE AVERAGE performance in the previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

Please indicate the extent to which you feel:

- PANAS

*Page 14*

- Self-Efficacy

*Page 15*

- Goal Commitment

*Page 16*

You will have two minutes to generate as many novel uses as possible for a WIRE CLOTHES HANGER. The page will advance automatically after two minutes.

Reminder: **Goal Condition: Generate at least X uses in the next task; Do-your-best**

**Condition: Do your best to generate as many uses as possible in the next task.**

**Encouragement Condition:** Again, due to your ABOVE AVERAGE performance in the previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

*Page 17*

You have complete the first trial.

Your second trial will begin on the next page.

*Page 18*

You will have two minutes to generate as many novel uses as possible for a SINGLE SHEET OF PAPER.

The page will advance automatically after two minutes.

Reminder: **Goal Condition: Generate at least X uses in the next task; Do-your-best**

**Condition: Do your best to generate as many uses as possible in the next task.**

**Encouragement Condition:** Again, due to your ABOVE AVERAGE performance in the previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

*Page 19*

You have completed the second trial.

Before beginning the third trial, please answer the following questions:

*Page 20*

- PANAS

*Page 21*

- Self-Efficacy

*Page 22*

- Goal Commitment

*Page 23*

Your third trial will begin on the next page.

*Page 24*

You will have two minutes to generate as many novel uses as possible for a PEN. The page will advance automatically after two minutes.

**Reminder: Goal Condition: Generate at least X uses in the next task; Do-your-best**

**Condition: Do your best to generate as many uses as possible in the next task.**

**Encouragement Condition:** Again, due to your ABOVE AVERAGE performance in the previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

*Page 25*

You have completed the third trial.

Your fourth trial will begin on the next page.

*Page 26*

You will have two minutes to generate as many novel uses as possible for a COMPACT DISK (CD). The page will advance automatically after two minutes.

Reminder: **Goal Condition: Generate at least X uses in the next task; Do-your-best**

**Condition: Do your best to generate as many uses as possible in the next task.**

**Encouragement Condition:** Again, due to your ABOVE AVERAGE performance in the previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

*Page 27*

You have completed the fourth trial.

Before beginning the fifth and final trial, please answer the following questions:

*Page 28*

- PANAS

*Page 29*

- Self-Efficacy

*Page 30*

- Goal Commitment

*Page 31*

Your fifth trial will begin on the next page.

*Page 32*

You will have two minutes to generate as many novel uses as possible for a PLASTIC DRINKING CUP. The page will advance automatically after two minutes.

Reminder: **Goal Condition: Generate at least X uses in the next task; Do-your-best**

**Condition: Do your best to generate as many uses as possible in the next task.**

**Encouragement Condition:** Again, due to your ABOVE AVERAGE performance in the



previous round, it is expected that you will have no problem in **goal condition: attaining your goal. Do-your-best condition: performing well.**

*Page 33*

You will now be asked about the task and your performance, please read each item carefully and answer honestly.

*Page 34*

- Goal Difficulty Manipulation Check

*Page 35*

- Encouragement Manipulation Check

*Page 36*

Thank you for your participation in the study. This study was concerned with different strategies and how the addition of goals and encouragement affected performance outcome. Specifically, we were looking to see differences between optimists and defensive pessimists (those who set low goals even though they have no reason to doubt high performance levels) on a task when they were assigned a difficult goal or told to do their best, and when they were given encouragement or not.

Please enter the code below on the MTurk website to receive compensation for your participation.