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Effect of Emotion on Achievement Goal Performance

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Abstract

The effect of emotion on the performance of individuals with different achievement goals (mastery, performance-approach, and performance-avoidance) was measured using a mixed ANOVA design. Participants learned the Left-to-Right Cross Multiplication technique and were randomly assigned to one of the three achievement goals. After the completion of a multiplication test, participants viewed a positive (happiness) or negative (sadness) film clip. Participants then completed a second multiplication test to determine the effect of the emotion on performance. Results showed that participants improved from the first to the second tests. The effects of achievement goal and affect on performance were not significant. The interaction between achievement goal, affect, and performance was also not significant.

Effect of Emotion on Achievement Goal Performance

I knew all of the information that my professor said would be on the final exam in my sociology class. Before I could take the exam, I received the news that my grandmother had suffered from a seizure and would no longer be alive within the next seventy-two hours. When I took my exam, all of the information that I would need to ace the exam was in my head, but I did not know how well I would perform considering my emotional preoccupation with my grandmother's death.

Based on this experience, I came to the realization that external events may temporarily influence one's academic competence. Students may enter a classroom goal-driven and prepared to take an exam after studying for the previous few weeks, but recent emotional events could interfere with their mental focus and performance. For instance, students may view a romantic film, console their sobbing friend, or have a fight with their roommate prior to arriving to class. Each of these experiences could distract a student from his or her goal of academic achievement. With the many possibilities for arousal of emotions in students, studying the effect of emotions on achievement goals and academic performance could offer insight into students' performance in academic settings. The effect of varied emotions on the performance of students who utilize different achievement goals could enhance the comprehension of students' academic achievement.

Dichotomous Model of Achievement Goals

Currently, achievement motivation is most studied through the achievement goal theory (Elliot & Harackiewicz, 1996). An achievement goal is characterized by the want to achieve, develop, or show competence at a task (Dweck, 1986; Pintrich, 2000). Researchers have distinguished among different achievement goals, such as ability vs. mastery goals, performance vs. learning goals, and ego involvement vs. task involvement (Butler, 1992; Elliot & Dweck, 1988; Koestner, Zuckerman & Koestner, 1987). Ames and Archer (1988) proposed that the differences in individual achievement goals could be classified into two main categories: mastery and performance goals (see Figure 1).

Ames and Archer (1988) assessed participants' perception of goal utilization, techniques for learning, attitudes, causal attributions, and choice of task difficulty. The researchers found that students who viewed mastery goals as most salient were more likely to use effective learning strategies, have positive attitudes about the class, believe that a connection existed between their effort and future success, and enjoy tasks that were challenging. Students who perceived performance goals as the predominant goal focused more on their individual ability, negatively critiqued their ability, and blamed their lack of ability if failure resulted (Ames & Archer 1988).

Mastery vs. Performance Goals

Mastery goals, as defined by Elliot and Church (1997), reflect the importance of increasing competence and mastering the task at hand. A student with mastery goals is interested in gaining insight and increasing knowledge of and success at the task (Midgley, Kaplan, & Middleton, 2001).

Students with performance goals, on the other hand, aim to show their competence in relation to others (Ames & Archer, 1987). Dweck and Leggett (1988) found that individuals motivated by performance goals show specific cognitions, affect, and behavior. They possess cognitions centered on the acceptability of their ability, experience negative affective states such as shame, anxiety, boredom, depression, and defiance, and exhibit behaviors that are motivated to seek easy tasks and avoid challenging ones (Dweck & Leggett, 1988). Compared to mastery-oriented individuals, performance driven students enjoy tasks less (Nicholls, 1989). However, Harackiewicz and Elliot (1993) found that performance goal students are more interested in the activity if they have high achievement motivation.

Dweck and Leggett (1988) found that individuals with performance goals utilize the helpless pattern, which is characterized by the desire to avoid challenges and to give up in the face of failure. As not to appear as if they lack skill or ability, individuals with performance goals are likely to withdraw from a task if failure seems probable as opposed to persisting through the task, which is characteristic of individuals with mastery goals. Because individuals with performance goals are likely to stop putting forth effort if failure seems likely, performance goals are maladaptive (Ames & Archer, 1988; Dweck & Leggett, 1988). However, if the performance goal motivated students complete an easy task and consider themselves successful and competent, these behaviors can be adaptive (Dweck & Leggett, 1988).

Trichotomous Model of Achievement Goals

Early research conducted by Hoppe (1930) focused on the relevance of success and failure in setting and achieving future goals. Atkinson and Litwin (1960) proposed that success and failure motives shape the desire to partake in tasks of differing levels of difficulty. Elliot and Harackiewicz (1996) included these motives when proposing the trichotomous model of achievement goals. In the trichotomous model, the concept of the mastery goal remains the same, but the performance goal is separated into two distinct categories: performance-approach goal (success motive) and performance-avoidance goal (failure motive).

Elliot and Harackiewicz (1996) proposed that individuals with mastery or performance-approach goals self-regulate in order to reach the positive outcomes of task mastery or comparative competence, respectively. Individuals with these approach goals are characterized by optimal engagement in tasks where they focus on information that pertains to success, involve themselves emotionally and cognitively, and analyze challenges. Elliot and Harackiewicz proposed that performance-avoidance individuals, on the other hand, self-regulate based on possible negative results which arouse "self-protective processes," like heightened awareness of information relevant to failure, anxiety due to concern with others' judgment of the self, lack of focus on the task at hand, emotional and cognitive withdrawal, and appraisal of the threat as opposed to the challenge (p. 462). The experimenters suggested that the "self-protective processes" inhibit successful task completion.

To test the hypothesis, Elliot and Harackiewicz (1996) presented Nina puzzles to students randomly assigned to mastery, performance-approach, performance-avoidance,

and neutral goal groups. Results showed that performance-approach students demonstrate an equivalent amount of intrinsic motivation as mastery goal students. Elliot and Harackiewicz found that performance-avoidance students perform as well and work as hard as students in the other groups; however they show less task involvement and less intrinsic motivation than mastery and performance-approach groups.

Elliot and Church (1997) added to the research on the trichotomous model of achievement goals. Instead of solely considering approach (motive to achieve) or avoidance (motive to avoid failure) as main components that differentiate mastery, performance-approach, and performance-avoidance goals, Elliot and Church proposed that competence expectancy (belief in the probability of attaining competence at the task) influences individuals' adoption of particular achievement goals (see Figure 2).

Elliot and Church (1997) found that participants exhibiting mastery achievement goals are driven by achievement motivation and have high competence expectancy. Individuals with performance-approach goals also have high competence expectancy; however they are grounded in both achievement motivation and fear of failure. Individuals with performance-avoidance goals are driven by fear of failure and low competence expectancy.

Mastery Goals

Based on the initial dichotomous model contrast of mastery and performance goals, Dweck and Leggett (1988) proposed that mastery goals instill a pattern of cognition, affect, and behavior called the mastery-oriented pattern. Individuals with mastery goals show the cognition of desiring to perform well by using any available

strategy, positive affect, and behaviors motivated to seek challenges that will prompt optimum growth and pride in mastering the task (Dweck & Leggett, 1988).

Harackiewicz and Elliot (1993) showed that individuals driven by mastery goals show higher intrinsic motivation when they have lower achievement orientation. With a low achievement orientation, mastery goal individuals tend not to focus on achieving an end result that could enable them to outperform others, as is the case for high achievement orientated individuals or typical performance-approach goal oriented individuals.

Instead, mastery goal driven individuals with low achievement orientation tend to possess a decreased concern for outcome (achievement) and a heightened preoccupation with enjoyment of the task at hand. Even if a task is particularly challenging, a student driven by mastery goals will persist despite errors or temporary failures (Harackiewicz & Elliot, 1993). Because mastery goals instill the desire to improve skills, seek challenges, and persist even with the risk of failure, mastery goals are considered to be adaptive (Ames & Archer, 1988; Dweck & Leggett, 1988).

More recent research based on the trichotomous achievement goal theory has found that individuals with mastery goals are likely to experience processes of excitement, which positively affect the likelihood of using mastery techniques to attain achievement results. Individuals with mastery goals are also likely to experience high intrinsic motivation (Elliot & Church, 1997). In terms of learning, Elliot and McGregor (1999) found that students with mastery goals are more likely than students with performance approach or avoidance goals to retain information, process deeply, and put forth effort. Despite the high level of effort, multilevel processing, and retention of

information, individuals with mastery goals tend to show decreased performance in comparison to performance-approach oriented individuals. As found by Barron and Harackiewicz (2001), who studied effects of multiplication tasks of differing difficulty on participants with varied achievement goal orientations, those students with mastery goals have high interest, but low performance in contrast to performance-approach goal students.

Performance-Approach Goals

Elliot and Harackiewicz (1996) defined individuals with performance-approach goals as seeking positive judgments of competence from others. With this goal, performance-approach driven individuals experience both motivation to achieve and fear of failure as core to motivation (Elliot & Church, 1997). Contrary to the results from the study conducted by Elliot & Harackiewicz (1996), Elliot and Church (1997) found that the contradiction between approach and avoidance goals within performance-approach goal students affects intrinsic motivation, making it null. Despite the lack of intrinsic motivation, individuals with performance-approach goals show high performance on graded activities. Performance approach individuals perform better than mastery or performance-avoidance goal students (Elliot & Church, 1997). In terms of learning, Elliot and McGregor (1999) found that performance-approach goal students are likely to superficially process information, put forth effort, and excel at memorization and learning techniques such as rote learning.

Performance-Avoidance Goals

Performance-avoidance goal oriented individuals focus on avoiding lack of skill and negative judgments of competence (Elliot & Harackiewicz, 1996). Instead of instigating a process of task absorption, as is the case with individuals with performance-approach goals, individuals with performance-avoidance goals manifest processes such as anxiety and distraction that halt productive activity and create helplessness.

Performance-avoidance goals are likely to be paired with lack of intrinsic motivation, self-handicapping, and procrastination (Elliot & Harackiewicz, 1996). Elliot and Church (1997) found that avoidance-approach goals not only undermine intrinsic motivation, but also performance. In reference to strategies of learning, Elliot and McGregor (1999) showed that performance-avoidance goals are highly correlated to superficial informational processing and disorganization. Overall, performance-avoidance goals are considered to be maladaptive (Elliot & Church, 1997).

Emotion

Emotions are defined as short-term subjective-physiological-functional-expressive phenomena (Reeve, 2005). Emotion influences memory functioning, learning, and motivation (Lewis & Haviland-Jones, 2004). More specifically, emotions affect attentional and cognitive abilities, long-term memory capabilities, creative problem solving, working memory, recall of positive and neutral material, interest and persistence in activities, decision-making, and self-regulation of performance and learning (Ainley, Corrigan, & Richardson, 2005; Ashby, Isen, & Turken, 1999; Carnevale & Isen, 1986; Leith & Baumeister, 1996; Meinhardt & Pekrun, 2003; Nasby & Yando, 1982; Santrock,

1976). Zeidner (1998) alleges that emotion is more instrumental in predicting learning and performance than motivation.

While some emotions are consciously recognized by individuals, research shows that affect can alter human processes even at an unconscious level. Automatic evaluation refers to the process by which humans automatically intake information and stimuli (Murphy & Zajonc, 1993). In a study conducted by Bargh, Chaiken, and Raymond (1996), participants were primed with words that relayed an attitude. Bargh et al. (1996) found that while participants did not consciously recognize the prime, their results suggested otherwise. The participants experienced the shortest latency in pronouncing the target words when there was valence-congruency among the prime and target words and longer latency when the valences of the prime and target words were incongruent. These results support the "automatic attitude activation effect," as stated by Bargh et al., and suggest that affect can be automatically absorbed and affect performance. Zajonc (1980) even argues that the affective state is the first stage of reaction to and retrieval of any stimuli. Before an individual can cognitively perceive a stimulus, the affective state is triggered and utilized to respond. Research additionally shows that emotion-producing stimuli affect unconsciously controlled physiological stability. Azavedo et al. (2005) found that the heart rate, stiffening of muscles, and body sway of participants change as a result of pleasant, unpleasant, and picture viewing. This research suggests that if participants do not consciously experience the affect of the stimuli, participants unconsciously experience the effects of emotion, which can alter their performance.

Pereira et al. (2006) conducted a study where participants viewed photographs of pleasant, unpleasant, and neutral images. As alluded to by Pereira et al., the participants were affected by a combination of conscious and unconscious affective states. Individuals' performance, measured by reaction time, was affected differently by differing emotional stimuli; this finding suggests that affective states are indeed internalized. Slowed reaction time was also found to build with time. This result suggests that exposure to emotion stimuli influences the gradual induction of the emotion and later performance interference. In attempt to explain the effect of emotion on performance, Pereira et al. suggests that participants prioritize the emotional item over the neutral item and divert resources from the neutral item. Another suggestion offers that individuals not only provide more resources to the emotional item, but also find it difficult to disengage from the information that suggests emotion (Koster, Crombez, Verschuere, & De Houwer, 2004). Leith and Baumeister (1996) add that preoccupation with a current affective state can lead to diminished self-control, which can hinder performance.

Research on emotion suggests that emotion affects major processes that are key to learning and performance, such as memory, interest, persistence, physiological homeostasis, and reaction time. Even if an individual does not consciously acknowledge the onset or experience of an emotion, research shows that the individual is affected by the emotion suggested by the stimulus.

Positive Affect

Historically, research on affect has led to the division of affective states into positive and negative affect. Research shows that positive affect is linked to motivation and preparation for actions, flexibility in thinking, decision making, problem solving, evaluating of events, increased persistence, decreased reaction time, increased memory, heightened satisfaction of tasks, increased performance, heightened capability of re-arranging concepts, viewing alternatives to ideas, and utilizing alternative cognitive perspectives, creatively organizing and categorizing people, events, and things, and experiencing relatedness in unmatched items (Brief, Butcher, & Robertson, 1995; Erez & Isen, 2002; Estrada, Isen, & Young, 1993; Fishbach & Labroo, 2007; Isen, Johnson, Mertz, & Robinson, 1985; Pereira et al., 2006; Santrock, 1976; Staw & Barsade, 1993; Weiss, Nicholas & Daus, 1999).

In Erez's and Isen's (2002) study on the effect of positive and neutral affect, participants were provided with a bag of candy (positive affect stimulus) or no bag of candy (neutral affect stimulus) before solving anagram tests. The participants were told that correctly solving anagram problems would result in the entrance of their names into a lottery. The number of anagrams solved, combinations attempted, persistence, and self-report of willingness to complete the test again were used to measure motivation. To measure valence, the experimenters allowed participants to rate the attractiveness of the outcomes. Participants also reported the probability of putting forth a certain level of effort and achieving a specific level of performance or outcome level, which measured expectancy and instrumentality, respectively. Erez and Isen found that participants experience different cognitive processes as influenced by their affective manipulation. In

accordance with the VIE theory, participants exposed to positive affect show higher valence, defined as the level of positive or negative evaluation of the outcome, higher perceptions of expectancy, defined as the belief that effort will lead to successful performance, and higher degree of effort in attempting to shape performance.

Participants exposed to positive affect outperformed the participants in the control group in terms of motivation and performance. These results suggest that positive affect increases individuals' belief that effort will produce the desired performance, overall effort exerted, motivation, and performance.

Porges (2003) suggests that positive affect inhibits defense systems and promotes pro-social acts that prevent internal states of tension; this reduction in tension, instigated by the affect stimulus, could be the cause for higher task performance in participants who view pleasant images in comparison to participants who view neutral images (Pereira et al., 2006). Similarly, Fishbach and Labroo (2007) found that participants who experience positive affect better perform on self-control tasks than participants in the neutral-emotion group. Individuals who experience positive affect are not only more likely than neutral or negative emotionally influenced persons to perform better, but are also more inclined to accept an accessible goal despite the content of the goal itself (Fishbach and Labroo (2007).

These findings suggest that individuals with positive affective states are more motivated, exert more effort, show more task enjoyment, and perform better than individuals with neutral or negative affective states.

Negative Affect

Negative affect has been found to limit the motivation utilizable for the goal at hand, decrease the overall desire for the goal, and stop activity geared toward goal accomplishment (Aarts, Custers, & Holland, 2007; Aarts, Gollwitzer, Hassin, 2004; Fishbach & Labroo, 2007). Negative affect impairs self-regulation, limits cognitive ability, narrows the view of possible ways in which to complete the task, increases reaction time, and promotes use of the first seemingly acceptable method (Keinan, 1987; Leith & Baumeister, 1996; Pereira et al., 2006).

Aarts et al. (2007) conducted a study where participants viewed a computer program that presented negative and neutral words. The valence of the word presentations were consciously unknown to the participants. The goal-prime-negative group viewed goal words in combination with negative words, goal-prime-neutral group viewed neutral words in combination with goal words, and no-goal-prime group viewed a combination of neutral and negative words with the goal words. Aarts et al. found that participants who received a goal in close proximity to negative affect were more likely to show a decrease in motivation and accessibility of the goal. Goal priming in proximity to negative affect can change participants' moods and negatively influence performance (Bargh & Cohen, 1978).

Pereira et al. (2006) found that negative affect increases reaction time; participants who view unpleasant pictures experience slower reaction times than individuals who were shown neutral pictures and pleasant pictures. Hartikainen, Ogawa, and Knight, (2000) found that participants' performance on identification of target stimuli orientation is also impaired post viewing of emotional stimuli. Fishbach and Labroo

(2007) suggested that negative affect has such effects due to its connection with the avoidance system. Accordingly, the avoidance system triggers the inhibition system, which, initiated by a threat, leads to a negative mood and withdrawal from the task. Other research suggests that negative affect interferes involuntarily in the completion of any task due to the distraction of and focus on the negative stimuli (Koster, Crombez, Verschuere, & De Houwer, 2004). Despite the differences in explanation, the common theme shows that negative affect distracts and unconsciously removes individuals from the tasks at hand.

Overall, the research suggests that negative affect increases reaction time and decreases motivation, self-regulation, creativity in problem solving, and performance.

Motivation and Emotion

Tamir, Chiu, and Gross (2007) found that participants with approach goals tend to favor positive approach emotions, such as excitement, and individuals with avoidance goals prefer negative avoidance emotions, such as worry or fear. The experimenters suggest that persons who utilize avoidance goals and view avoidance (negative) emotions as useful to creating the anxiety typical to performance-avoidance goal oriented individuals, may perform better with the negative emotion. Erber and Tesser (1992) also found that sadness leads to better performance on tasks that involve self-control if the task provides a distraction to the negative affect.

Duckworth et al. (2002) conducted a study on the effect of emotion on approach and avoidance tendencies. Participants were placed in front of a computer with a lever in front of their dominant hand. Participants were told to pull (approach condition) or push

(avoidance condition) the lever when a target appeared on the screen. Duckworth et al. found that participants in the approach condition responded more quickly to the positive stimuli while the participants in the avoidance condition showed shorter response rate to negative stimuli. This research suggests that individuals with approach motivation may tend to perform best in relation to positive affect. Avoidance motivated individuals, on the other hand, may best perform with exposure to negative affect.

The research that combines motivation and emotion suggests that individuals with approach motivation, such as mastery or performance-approach goals, prefer and perform better when they experience positive affect. Performance-avoidance goal driven individuals prefer and perform better when they experience negative affective states.

The Present Research

The present research aims to unite the research findings of achievement goals with that of emotion and performance. Considering that personal differences and situational demands affect the selection and utilization of achievement goals, it is important to study the effect of affect on all types of achievement goals (Maehr, 1983 cited in Ames & Archer, 1988). Based on previous research, mastery goal individuals tend to be more intrinsically motivated and approach oriented, leading to high performance. Performance-approach oriented individuals have low intrinsic motivation, a combination of approach and avoidance orientation, and show evidence of high performance. Performance-avoidance individuals have low intrinsic motivation and high avoidance orientation, which leads to low performance.

Positive affect is beneficial to learning, motivation, and performance. Individuals with approach orientations favor approach (positive) emotions and utilize those emotions to reach their goals. Negative affect negatively affects motivation, goal accomplishment, and learning ability. However, individuals with avoidance goals favor avoidance (negative) emotions and utilize those emotions in goal accomplishment.

It is hypothesized that mastery goal oriented students will show an increase in performance after exposure to the positive affect (happiness), due to the positive effect of positive affect in learning and performance and to the tendency for approach oriented individuals to prefer and perform better in relation to approach emotions like happiness. Students will perform poorly after exposure to the negative affect (sadness), due to the negative effect of negative affect on learning and performance and the tendency for approach oriented individuals to show decreased performance with negative affect.

Performance-approach oriented students are expected to perform better after exposure to happiness, due to the positive effect of positive affect on learning and performance. Alternatively, students will perform poorly after exposure to sadness, due to the lack of internal resources to handle both the negative emotion and the desire to outperform others. Overall, performance-approach oriented students are expected to perform better than the mastery-goal oriented counterparts in both conditions.

Performance-avoidance goal students are expected to perform only slightly better after the happiness exposure, due to practice effect. They will perform significantly better after the sadness exposure, because avoidance oriented individuals prefer and perform best in relation to negative emotion. Additionally, the sadness may further drive

the goal to not perform worse than others due to the similarity between sadness as a negative emotion and anxiety, which is typically experienced and used to drive performance-avoidance goal students. Overall, performance-avoidance goal students are expected to perform more poorly than the other two goal groups in the happiness condition, but better perform in the sadness condition.

To best simulate an academic setting, participants will complete the study in an academic classroom and will be asked to learn and utilize a new method of performing multiplication problems. Barron and Harackiewicz (2001) used the Flansburg and Hay (1994) Left-to-Right Cross Multiplication technique to measure interest and performance for mastery and multiple goal oriented students. The experimenters found that the math technique was effective and significantly utilized by the participants. Based on their findings, the Left-to-Right Cross Multiplication technique will be used in this study to test performance and to simulate a classroom scenario where an academic lesson is taught and later tested.

Method

Participants

One hundred and eight undergraduate students from the College of William and Mary psychology pool and volunteers from the community participated in this study. Forty-four females and 64 males were tested.

Materials

A packet consisting of the Flansburg and Hay (1994) Instructions for Left-to-Right Cross Multiplication, three sets of Lottery Instructions, two multiplication tests

containing 30 multiplication questions consisting of two-digit multiplication problems, and the Film Questionnaire. The Film Questionnaire consisted of three questions, "Who was the main character? What happened? What stands out in your memory?"

Procedure

Students were gathered in one classroom. After random seating, the consent forms were distributed and the experimenter explained that the participants were about to participate in a study that consisted of two unrelated studies. The first study would test their ability to learn and perform a new math skill. The second study would test their attentional capacity to film. The study was explained as two separate and unrelated studies in order to prevent participants from guessing that a connection existed between the deliverance of the emotion in the film and the performance on the posttest that directly followed. The experimenter then explained that the participants would be given five minutes to read over the Instructions for Left-to-Right Cross Multiplication technique and to complete the practice problems. The practice problems were provided to allow participants to familiarize themselves with the technique prior to Test I. This meant to ensure that the results on the first multiplication test were not abnormally low due to participants' first experience working with the new technique.

The Instructions for the Left-to-Right Cross Multiplication was passed out to each student (see Appendix A) and collected after five minutes.

The experimenter informed the participants of the opportunity to be entered in a lottery if they fulfilled the goals delineated in the Lottery Instructions (see Appendix B). One third of the Lottery Instructions contained instructions to master the technique

(mastery goal). One third of the Lottery Instructions instructed the participants to perform better than the other test-takers (performance-approach goal). One third of the Lottery Instructions consisted of instructions to not perform more poorly than the other test-takers (performance-avoidance goal). On each Lottery Instruction, the goal assignment was not directly named, so as to avoid any potential discrepancies in performance due to previous knowledge of achievement goal theory. The possibility of being entered into a lottery is outlined in order to create a desire of reaching the goal. According to Aarts et al. (2007), the unconscious pursuit of a goal does not solely rely on the accessibility of the conception of the goal, but also on the desirability of the goal, which motivates a person to use their resources. The potential to enter the lottery aims to increase the desirability of the goal. The lottery prize was not identified prior to the debriefing so as to ensure that all of the participants, not just those who favored the lottery item, had an equal level of interest in the lottery.

After the Lottery Instructions were distributed, the experimenter told the participants that they would receive a math test consisting of 30 multiplication problems, and that they would have two minutes to complete the test using the Left-to-Right Cross Multiplication technique. Two minutes was chosen as the test time allotment in order to prevent ceiling effects. If too much time were provided, participants could potentially answer all of the test problems, which would not allow for significant comparisons in test scores.

Students were provided with Test I face down. Once every student received the list of 30 multiplication problems, they were told to turn over the test. At the termination

of the two minute period, students were told to put down their pens and turn the tests face down. Test I was collected. The Lottery Instructions remained with the participants.

A two-minute lapse time was started. After two minutes, the experimenter informed the participants that they would receive a break from the math, and move on to the second unrelated study. The experimenter explained that the participants would watch a brief film clip and then answer a questionnaire on what they saw. The affect exposure was then presented. Based on the findings of Gross (1998) that indicated that participants who were told to watch a film experienced behavior expressive of the emotion, film clips were used to present the emotion. In accordance with the findings of Mogg and Bradley (1999) that suggested that facial expressions of emotion elicit emotional states in viewers, both affect film clips depicted live persons with facial expression. Either the laughing baby (positive affect condition) or the funeral scene (negative affect condition) was displayed on a large screen (see Appendix C).

The Film Questionnaire was distributed. The questionnaire consisted of questions so as to focus the participant on the event and emotion in the film. The questionnaire only consisted of three short questions so as to limit the time between the affect exposure (film) and performance testing (Test II). Limiting the time between the affect exposure and Test II meant to ensure that the participants still experienced the emotion during the posttest.

The film questionnaires were collected and the experimenter announced that the participants would return to the first unrelated study where they would use the Left-to-Right Cross Multiplication technique to answer 30 multiple choice questions in two

minutes. The experimenter reminded the participants to read the Lottery Instructions again to recall their goal.

Test II was distributed to each participant. Consistency of difficulty was maintained for both Test I and Test II by ensuring that an equal number of two-digit numbers that started with nine, with eight, with seven, and so on appeared on both tests. Once every participant received the test, the experimenter told the participants to start and told them to put their pens and pencils down after a lapse of two minutes.

After the collection of Test II and the Lottery Instructions, participants were debriefed.

Results

Using a one-way ANOVA, results showed that the effect of the goal on the correct-answer performance on Test I was not significant $F(2,106) = .71, p > .05$. Using a one-way ANOVA, the effect of the goal condition on attempted-answer performance on Test I was found not to be significant $F(2,106) = .96, p > .05$.

Using a 2 (Condition: happiness, sadness) x 3 (Goal: mastery, performance-approach, performance-avoidance) x 2 (Test: pretest, posttest) mixed ANOVA design, results showed that there was a significant increase in correct-answer and attempted-answer scores from the pretest to posttest $F(1,103) = .00, p < .001$.

The results of the 2x3x2 mixed ANOVA showed that the interaction between achievement goals and correct-answer and attempted-answer test scores was not significant $F(2,103) = .32, p > .05$. The effect of the affect on correct-answer and attempted-answer test performance was also not significant $F(1,103) = .83, p > .05$.

In the happiness condition, the raw data suggests that the performance-approach participants correctly answered the most questions in the pretest and posttest ($M = 2.83$ and 3.89 , $SD = 2.23$ and 2.05). However, the largest difference between the number of questions correctly answered in the pretest compared to the posttest occurred for the mastery group ($M = 1.56$, $SD = 1.58$). In analyzing the number of questions attempted, the performance-approach participants attempted the most answers in the pretest and posttest ($M = 4.22$ and 5.78 , $SD = 1.66$ and 1.63). Once again, the mastery participants showed the most improvement between the pretest and posttest ($M = 1.83$, $SD = 0.99$) (see Table 1).

In the sadness condition, the raw data implies that the mastery participants answered the most questions correctly in the both the pretest and posttest ($M = 2.44$ and 3.89 , $SD = 1.85$ and 2.27). However, the performance-avoidance group showed the most improvement ($M = 1.89$, $SD = 1.68$). In number of questions attempted, the mastery group attempted the most questions ($M = 4$ and 5.89 , $SD = 1.46$ and 1.84). The mastery orientation group also showed the most improvement in number of questions attempted ($M = 1.89$, $SD = 1.08$) (see Table 2).

Despite the suggested findings in the raw data, the results of the ANOVA show that the combined effect of the goal and affect on correct-answer test performance was not significant $F(2,103) = .79, p > .05$. Results were the same for the effect of goal and affect on attempted-answer test performance.

Discussion

All of the goal groups showed an increase in performance from the pretest to the posttest. This result was most probably due to practice effect and a bettered understanding of the length of the two minute time allotment.

There was no significant effect of the achievement motivation goals on performance. Unlike the results found by Elliot and Church (1997) that suggest that performance-approach oriented individuals perform better than mastery or performance-avoidance driven individuals, the present results show that the achievement goal orientation does not affect performance level. This result also does not reflect the findings of Elliot and Harackiewicz (1996). Their study showed that assigning achievement motivation goals through the delivery of task instructions is an effective method of instilling achievement goals.

A possible reason for the results that showed that the effect of achievement goals on performance was not significant could be due to the participants' lack of time management during the completion of Test I and better time concept during Test II. When Test II was provided, it is likely that the participants had a more realistic understanding of the speed at which they should work in order to answer the most questions in the short two minute time frame. As a result, the participants, despite the achievement goal assignment, may have worked more quickly, and thus attempted and correctly answered more questions in Test II.

Additional results show that affect did not have a significant effect on performance. These results did not confirm the findings by Fishbach and Labroo (2007),

which showed that participants with positive affect perform better than neutral or negatively emotionally influenced individuals.

One possible explanation for the results that showed that the effect of affect on performance is not significant is that participants could have been unaffected by the film. However, the Film Questionnaires show that the participants recognized the smiles, happiness, and "contagious laughter" of the laughing baby and the sad and crying faces of the funeral attendees in the funeral clip. During the study, participants were found to laugh out loud or smile (happiness condition) and frown (sadness condition). Additionally, based on the findings of Bargh et al. (1996) and Pereira et al. (2006), it can be assumed that the happiness and sadness stimuli (film) affected the participants, because individuals are affected unconsciously if not consciously by affect stimuli. Thus, even if the results from the questionnaire and the behaviors demonstrated in the study were not reflective of conscious experience of the emotions, it can be assumed that the affect stimuli (film) unconsciously affected the participants.

Consistent with the hypothesis, although not significant, individuals in the happiness condition with performance-approach goals performed better (answered the most problems correctly and attempted the most problems) during the pretest and posttest. This pattern is consistent with the findings of Elliot and Church (1997), which showed that performance-approach individuals show the highest level of performance in comparison to the other achievement goal groups. This finding could suggest that the positive affect, happiness, does not interfere with the underlying goal of attaining high achievement of the performance-approach participants.

Contrary to the hypothesis that the performance-approach group would show the greatest improvement in performance from the pretest to posttest in the happiness condition, the raw data suggests that the mastery group had the largest improvement in correctly answered and attempted questions. This pattern is consistent with the findings of Ames and Archer (1988) that showed that mastery goal individuals possess high intrinsic motivation and thus high performance and of Duckworth et al. (2002) that showed that approach motivated individuals perform better in relation to positive affect. This finding may suggest that the performance of the mastery goal individuals could have been positively affected by the influence of happiness.

Unlike the prediction that the performance-avoidance group would perform better than the mastery and performance-approach groups in the sadness condition, the mastery goal group correctly answered and attempted to solve the most multiplication problems on the pretest and posttest in the sadness condition. This finding is consistent with the expectation that mastery individuals perform well due to their mastery-orientation pattern and desire to pursue challenges with high intrinsic motivation (Dweck & Leggett, 1988). The consistent high performance may suggest that the sadness affect does not negatively affect the performance of mastery goal driven individuals. Additionally, the mastery goal participants showed the greatest increase in the number of attempted problems answered between the pretest and posttest. This finding could also suggest that the negative affect, sadness, does not interfere with the intrinsic motivation utilized to reach the participants' goal of mastery.

Consistent with the hypothesis, the performance-avoidance group showed the greatest performance improvement in the number of correctly answered problems in the sadness condition. This finding could suggest that performance-avoidance individuals' performance may benefit from the negative affect of sadness. Based on the findings of Elliot and Harackiewicz (1996), Elliot and Church (1997), Tamir et al.(2007) that state that performance-avoidance individuals utilize and depend on anxiety, are motivated by fear of and avoidance of failure, and prefer avoidance emotions such as fear or worry as motivating agents, it follows that the performance-avoidance goal participants may have utilized the sadness affect to motivate themselves and increase performance on correctly answered problems (see Figure 3).

Despite the findings suggested by the raw data, the repeated mixed ANOVA design showed that there was no interaction between the performance goals, emotion, and performance (correct-answer and attempted-answer scores). Many factors could have contributed to the statistical results of these findings.

For instance, as previously mentioned, participants may not have been aware of the actual duration of the two minute time allotment. After completing Test I, the participants may have gained a better understanding of how to best use two minutes to answer 30 multiple choice questions. The better understanding of time usage, and not the effect of goal and affect, may explain the overall increase in performance on Test II. In future research, participants should be provided with three multiplication tests. The first multiplication test should allow for the participants to become adjusted to the math technique and time allotment. The introduction of an extra math test would account for

the confounding variable of time adjustment on the increase in performance. The affect stimulus would then be administered between Test II (pretest) and Test III (posttest).

Another confounding variable could be the overall time allotment. Two minutes may not be sufficient time to allow participants to show a significant difference in performance between the first and second tests, and thus show an effect of goal and emotion on performance. In the future, a pilot study should be conducted to ascertain the length of time needed to answer 30 multiplication questions. Based on the findings, an amount of time should be selected so that only 5% of the participants can potentially answer all of the questions in the time frame. With more time, there is a higher probability that a larger difference between scores on the pretests and posttests and significant results could be found.

Additionally, the Lottery Instructions may not have convinced the participants to follow the goal. For example, Harackiewicz and Elliot (1993) found that individuals with high achievement orientation showed greater enjoyment of a pinball game if they were given the performance goal and individuals with low achievement had greater interest in the activity when they were given the mastery goal. Based on these findings, the assigned goals may have been more influential to the participants' performance if a questionnaire first assessed their achievement orientation so that the achievement goal matched their natural achievement orientation.

The affect stimulus may not have had enough strength. For instance, the film clips may have more powerfully affected the participants if they had lasted for longer than 30 seconds. The stimuli also may have been more effective if the participants could

have personally related to the stimuli. For example, instead of viewing a film clip, the participants could have been asked to write a story about the happiest or saddest moments of their lives.

Despite the results of this study that showed that the effect of emotion on the performance of individuals with different achievement motivation goals (mastery, performance-approach, and performance-avoidance) was not significant, the foundational concepts presented in this study deserve further attention and research.

Future studies should first conduct preliminary research on achievement goal internalization. A method should be devised to ensure that the delivery of an achievement goal (that may not be innate to the participant) is strongly ingrained in the participant to the point that it will affect performance. Reading goal instructions aloud, signing a contract on goal understanding, or participating in a group discussion where one goal is chosen, are all possible methods of instilling the achievement goal in participants. Another possibility lies in the testing of participants on innate goals and utilizing those achievement goals as the assigned goal.

Preliminary research should also test whether a 30 second film clip has the strength to emotionally impact a participant to the point of significantly affecting performance. The film topic, length, and duration of influence of the emotion on the participant should be tested.

Future research could utilize the results from the preliminary findings in conjunction with the procedure from the current study to test for significant interaction between achievement goal, affect, and performance.

Future research should also test emotions other than happiness and sadness. Additionally, research should utilize a control condition (neutral emotion), which could be used to identify the baseline of performance and improvement from the pretest to posttest. This information would be useful in analyzing the true effect of affect on performance and in broadening the scope of understanding the effect of varying emotions on performance of individuals with different achievement goals.

The school system today is meant to teach students by providing them with information and testing them on their understanding. A grading method solidifies this process by classifying the performance of students. This classification system is supposed to indicate the students' level of understanding. However, what if the student cannot perform due to an emotion that influences the performance? The performance would thus lead the student to receive a grade that inaccurately reflects his or her understanding and/or the teacher's quality of instruction. If further research can show that emotion affects the performance of students with different achievement goal styles, major changes could be made to the education system that require testing of students' achievement goal orientations and consideration of students' affective states prior to test taking. This change in the education system could ensure that grades truly reflect the knowledge that a student has gained from the class. Until research is conducted that shows significant results, this study will remain a stepping stone to fully understanding the connection between achievement goals, emotion, and performance.

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Appendix A

Instructions for Left-to-Right Cross Multiplication

The study in which you are about to partake consists of two unrelated studies. The first study is aimed to test your math skills. The second study will test attentional factors in relation to film. Instructions for the second study will come later.

For the first portion of the study, you will solve multiplication problems. You will not use any previously learned methods of multiplication. Instead, you will learn and

utilize the new Left-to-Right Cross Multiplication technique. Please read the instructions for the Left-to-Right Cross Multiplication technique and practice as you go along.

LEFT-TO-RIGHT CROSS MULTIPLICATION

$$\begin{array}{r} 36 \\ \times 24 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \ 6 \\ \downarrow \\ 2 \ 4 \\ \hline \end{array}$$

We start on the left—in this case, with the tens column—to build a **base number**. We are going to multiply 2×3 , which will give us **6**, but we must remember that we are *really* multiplying $3(0) \times 2(0)$. That means our base number of **6** takes with it those two magic zeros, and so it is *really* **6(00)**.

Now multiply $2(0)$ —the tens digit in the bottom number—times **6**, the units digit in the top number.

$$\begin{array}{r} 3 \ 6 \\ \swarrow \searrow \\ 2 \ 4 \end{array} \quad 2(0) \times 6 = 120$$

Add that to our base number, **6(00)**, to get a new base number, **72(0)**.

All right, now move over to the units digit in the bottom number, which is a **4**. Multiply the tens digit in the top number, $3(0)$ times **4**:

$$\begin{array}{r} 3 \ 6 \\ \swarrow \searrow \\ 2 \ 4 \end{array} \quad 3(0) \times 4 = 12(0)$$

Add it to the base number of **720** for a new base number, **84(0)**.

And finally, multiply both units digits, **4** times **6**:

$$\begin{array}{r} 3 \ 6 \\ \downarrow \\ 2 \ 4 \end{array} \quad 4 \times 6 = 24$$

Add the result to the base number of **84(0)**, and this should give us our **answer**:

$$\begin{array}{r} 84(0) \\ + 24 \\ \hline 864, \text{ or } 864 \end{array}$$

Please complete the following practice examples. $24 \quad 82 \quad 17$
 $\quad \quad \quad \times 15 \quad \times 33 \quad \times 75$

Correct Answers: 360, 2706, 1275

Appendix B

Lottery Instructions

Lottery Instructions

Student ID: _____

You have the opportunity to be entered in a lottery to win a prize. In order to be entered, you must fulfill the following goal:

The goal of this multiplication task is to show that your understanding of the Left-to-Right Cross Multiplication technique has improved. Based on your exhibition of your mastery of the Left-to-Right Cross Multiplication technique, your name will be entered in a lottery. In a couple weeks, the drawing will take place and you will be notified if you win!

Lottery Instructions

Student ID: ____ ____ ____ ____

You have the opportunity to be entered in a lottery to win a prize. In order to be entered, you must fulfill the following goal:

The goal of the Left-to-Right Cross Multiplication technique is to show that you can perform better than the average student using Left-to-Right Cross Multiplication technique. Based on your better performance in comparison to the other test-takers, your name will be entered in a lottery. In a couple weeks, the drawing will take place and you will be notified if you win!

Lottery Instructions

Student ID: ____ ____ ____ ____

You have the opportunity to be entered in a lottery to win a prize. In order to be entered, you must fulfill the following goal:

The goal of the Left-to-Right Cross Multiplication technique is to show that you do not perform more poorly than the average student using the Left-to-Right Cross Multiplication technique. Based on your performance, showing that you did not perform more poorly than other test-takers, your name will be entered in a lottery. In a couple weeks, the drawing will take place and you will be notified if you win!

Appendix C

Film Clips

Happiness condition: Baby laughing: {HYPERLINK
"http://www.youtube.com/watch?v=5P6UU6m3cqk" }

Sadness condition: Funeral: {HYPERLINK "http://www.youtube.com/watch?
v=AplvrTHuIzw" }

Table 1

Performance of Achievement Goal Oriented Participants in Happiness Condition

	Mastery	Performance-Approach	Performance Avoidance
Total Correct Pretest	32	51	39
Total Correct Posttest	60	70	63
Mean Correct Pretest	1.78	2.83	2.17
Mean Correct Posttest	3.33	3.89	3.50
Mean Difference	1.56	1.06	1.33
Total Attempted Pretest	63	76	63
Total Attempted Posttest	96	104	91
Mean Attempted Pretest	3.50	4.22	3.50
Mean Attempted Posttest	5.33	5.78	5.06
Mean Difference	1.83	1.56	1.56

Table 2

Performance of Achievement Goal Oriented Participants in Sadness Condition

	Mastery	Performance-Approach	Performance-Avoidance
Total Correct Pretest	44	28	28
Total Correct Posttest	70	52	62
Mean Correct Pretest	2.44	1.56	1.56
Mean Correct Posttest	3.89	2.89	3.45
Mean Difference	1.44	1.33	1.89
Total Attempted Pretest	72	56	68
Total Attempted Posttest	106	87	91
Mean Attempted Pretest	4.00	3.11	3.78
Mean Attempted Posttest	5.89	4.83	5.06
Mean Difference	1.89	1.72	1.28

Figure Caption

Figure 1. Differences between mastery and performance oriented individuals

Figure 2. Revised model of hierarchy of achievement goals

Figure 3. Difference in mean performance of goal-oriented participants in affect conditions

Table 1
Achievement Goal Analysis of Classroom Climate

Climate dimensions	Mastery goal	Performance goal
Success defined as. . .	Improvement, progress	High grades, high normative performance
Value placed on. . .	Effort/learning	Normatively high ability
Reasons for satisfaction. . .	Working hard, challenge	Doing better than others
Teacher oriented toward. . .	How students are learning	How students are performing
View of errors/mistakes. . .	Part of learning	Anxiety eliciting
Focus of attention. . .	Process of learning	Own performance relative to others'
Reasons for effort. . .	Learning something new	High grades, performing better than others
Evaluation criteria. . .	Absolute, progress	Normative

Material reprinted from Ames, C., & Archer, J. (1988). Achievement goals in the classroom:

Students' learning strategies and motivation processes. *Journal of Educational Psychology*, 80, 260-267.



Material reprinted from Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology*, 72, 218-232.

