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# Can goal specific self-efficacy measures predict goal choice: understanding the 2x2 achievement goal framework through self-efficacy theory

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**CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT GOAL  
CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT GOAL  
FRAMEWORK THROUGH SELF-EFFICACY THEORY**

by

**RICHARD JAMES LUCIDO**

**DISSERTATION**

Submitted to the Graduate School

of Wayne State University

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

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MAJOR: EDUCATIONAL PSYCHOLOGY

Approved by:

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Advisor

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## DEDICATION

This dissertation is dedicated to my loving wife Sarah who has supported me from day one on this journey. Her ongoing love and encouragement gave me the strength to get through this seemingly never ending task. This dissertation is also dedicated to my children Samuel, James, and Jack who I love very much. Finally, this dissertation is dedicated to my parents who have always stood by my decisions and lead me down the path to success. Thank you very much and I love you all.

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## Chapter I

## Introduction

*Background*

The improved understanding of the social cognitive processes underlying achievement motivation is of primary importance to educational psychology. Much of the variance in educational performance beyond the effects of cognitive ability can be accounted for by the social cognitive variables of achievement goals and self-efficacy (e.g., Steinmayr & Spinath, 2009). While a strong understanding has developed in regards to each of these constructs individually, there has been a lack of a theoretical integration between them. Although science has historically benefited from theoretical reductions, the study of achievement motivation has struggled to integrate its constructs into meaningful wholes, which has necessarily limited the effectiveness of its application. Thus, the development of frameworks that can reduce and integrate existing constructs is vital to the growth and utility of educational psychology. The purpose of the present study is to test a framework where goal adoption is understood through self-efficacy theory. If supported, the framework would represent progress toward a more integrated theory of achievement motivation.

*Statement of the Problem*

Goal orientation is a central construct in the achievement motivation literature. In such research, two main types of goals are often described: performance goals and mastery goals (e.g., Dweck, 1986, 1992; Nicholls, 1984). Mastery goals pertain to the desire to acquire knowledge and competence, the desire to improve and grow, while performance goals correspond to the desire to perform well compared with others. In

other words, mastery goals are concerned with gaining competence while performance goals are concerned with demonstrating competence. More recent conceptualizations break up each goal into an approach and avoidance component resulting in a 2x2 framework (Elliot & McGregor, 2001). The framework contains four achievement goals: mastery approach (focused on attaining task-based or intrapersonal competence), performance approach (focused on attaining normative competence), mastery avoidance (focused on avoiding task-based or intrapersonal incompetence), and performance-avoidance (focused on avoiding normative incompetence).

The associations of the 2x2 achievement goal framework among college students have been well studied. The literature suggests that performance approach goals are related to higher levels of academic achievement, as measured by grades, than are mastery approach goals (Elliot, McGregor, & Gable, 1999; Fenollar, Roma'n, & Cuestas, 2007). While not related to objective measures of performance, mastery approach goals are related to higher levels of subject interest (e.g., Durick, Lovejoy, & Johnson, 2009) and deep processing (e.g., Elliot & McGregor, 2001; Phan, 2009) as compared to performance approach goals. In contrast to approach goals, both performance avoidance and mastery avoidance goals are generally found to have maladaptive associations among college students. These include disorganization (Coutinho & Neuman, 2008; Elliot & McGregor, 2001), lower academic performance (Durik et al, 2009; Fenollar et al, 2007), and procrastination (Howell & Burro, 2009).

Dweck and Legget (1988) proposed that achievement goal orientation stems from

one's implicit theory of intelligence. In this model, individuals tend to adopt either an entity theory of intelligence, meaning the idea that their intelligence is a fixed quantity and they could do little to change it, or an incremental theory of intelligence, the idea that their intelligence is not a fixed quantity and can be improved through effort. In academic settings, holding an incremental theory as opposed to an entity theory is associated with a adaptive outcomes such as improved academic performance (Blackwell, Trzesniewski, & Dweck, 2007; Aronson, Fried, & Good, 2002) and a pattern of attributing failure to lack of effort rather than ability (Hong, Chiu, Dweck, Lin, & Wan, 1999).

It has long been proposed that implicit theories produce their effects by influencing goal orientation (Dweck, 1999; Dweck & Leggett, 1988). In this model, an entity theory of intelligence is thought to produce performance goals while an incremental theory of intelligence is thought to produce mastery goals. An individual with an entity theory thinks that their intelligence is generally unalterable, therefore the majority of tasks in school become measures of that immutable intelligence. This leads one to become overly concerned with demonstrating to themselves and others that they have an adequate level of intelligence. Consequently, they become focused on either performance approach or performance avoidance goals. Conversely, a person who believes their level of intelligence to be malleable is not burdened by a need to constantly demonstrate competence, because any deficit that may be apparent to others is viewed as being temporary and malleable. They are therefore likely to adopt mastery goals in academic situations.

The assertion that achievement goals are primarily the result of implicit theories has received some empirical support (Dweck & Legget, 1988; Robins & Pals, 2002),

However, the majority of studies examining this question failed to produce results that supported the hypothesized relationship (e.g., Elliot & McGregor, 2001; Howell & Buro, 2009). In this research, many of the correlations were found to be in the opposite direction of what would have been predicted by the model. In the cases where the direction of the correlations were consistent with the model, the relationships were found to generally be very small, often lacking in statistical significance. Therefore, it appears that another process may be needed to explain the origin of achievement goals within the individual.

Self-efficacy refers to an individual's perceived capabilities to learn or perform behaviors at a designated level (Bandura, 1986, 1997). Unless individuals believe that they will be able to successfully engage in a task and obtain a desired outcome, they have little reason to initially engage in that task let alone persist in the face of obstacles. Because of this, behavior can often be better predicted by one's self-efficacy beliefs than by their actual capacity to perform effectively (e.g., Zimmerman & Bandura, 1994). Measures of perceived self-efficacy are predictive of academic achievement (Multon, Brown, & Lent, 1991) as well as persistence and effort in the face of difficult academic tasks (Bouffard et al, 2005; Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk, 1981). It will be argued here that achievement goal orientation could be understood through self efficacy theory.

Self-efficacy can be measured at various levels of specificity. For example, a researcher could measure a student's general academic self-efficacy, their mathematics self-efficacy, their self-efficacy for calculus, or their self-efficacy for the particular

calculus course in which they are enrolled. Research indicates that measures of self-efficacy will become more closely related to measures of performance and motivation the more specific the domain of self-efficacy that is measured (Choi, 2004; Pajares & Miller, 1995; Steinmayr & Spinath, 2009).

The current study measured self-efficacy at a new level of specificity, the level of the achievement goal and not just the task in general. It will be proposed that a student will have a degree of perceived self-efficacy for mastery approach goals, another for their degree of perceived efficacy for mastery avoidance goals, performance approach goals, and performance avoidance goals. It will be hypothesized that an individual's profile of goal specific self-efficacy is predictive of achievement goal adoption. This hypothesis is based in the research indicating that perceived self-efficacy is a determinant of task choice (Bandura & Schunk, 1981; Hackett & Betz, 1989; Escartí & Guzmán, 1999), where people tend to engage in tasks for which they have the highest degree of self-efficacy. It will be argued that, from a first person cognitive perspective, the selection of an achievement goal is like the selection of a task, therefore the processes that effect task selection ought to apply to achievement goal selection.

#### *Purpose of the Study*

The purpose of the current study is to explore the validity of the concept of goal specific self-efficacy and to measure its covariation with achievement goals relative to that of implicit theories of intelligence.

### *Research Questions*

The following research questions were addressed in this study:

1. Can goal specific self-efficacy be used to predict achievement goal adoption?
2. Are implicit theories related to achievement goal adoption, and what is the degree of that relationship relative to the construct of goal specific self-efficacy?
3. What is the nature of the relationship between implicit theories and one's degree of goal specific self-efficacy?
4. To what extent do student's achievement goals differ across the classes in which they are enrolled in a semester, and are these differences associated with congruent changes in their profile of goal specific self-efficacy?
5. Can the effects of manipulations to one's theory of intelligence on goal orientation be explained by changes in the degree of ones self-efficacy for mastery approach goals?

### *Assumptions of the Study*

The following assumptions were made for the study:

- The instruments used to measure achievement goals, implicit theories, and goal specific self-efficacy were assumed to be valid and reliable measures of those constructs
- The participants were assumed to respond to the instruments in a careful and honest manner

### *Definition of Terms*

The following terms were defined for use in this study:

#### *Achievement Goals:*

A goal is a cognitive representation of a future object that an organism is committed to approach or avoid (Elliot & Niesta, 2009). In this study, the term *achievement goal* will refer the one of the four goals in the 2x2 model of goal orientation (Elliot & McGregor, 2001). The model contains four achievement goals: mastery approach (focused on attaining task-based or intrapersonal competence), performance approach (focused on attaining normative competence), mastery avoidance (focused on avoiding task-based or intrapersonal incompetence), and performance avoidance (focused on avoiding normative incompetence).

#### *Self-Efficacy:*

The beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments (Bandura, 1997).

#### *Goal Specific Self-Efficacy:*

Self-efficacy as pertaining to individual achievement goals within the 2x2-goal framework, such as self-efficacy for mastery approach goals or self-efficacy for performance avoidance goals. For example, self-efficacy for mastery approach goals (also termed mastery approach self-efficacy) refers to the belief in ones capabilities to organize and execute the course of action required to attain task-based or intrapersonal competence. Whereas, self-efficacy for performance avoidance goals refers to the beliefs in ones capability to organize and execute the course of action require to avoid normative incompetence.

#### *Implicit Theories:*

The belief that one holds regarding the malleability of their intelligence (Dweck, 1999; Dweck & Leggett, 1988). Two contrasting beliefs are identified. Individuals labeled as entity theorists believe that their intelligence is a fixed quantity and they could do little to change it. In contrast, individuals labeled as incremental theorists believe that their intelligence is not a fixed quantity and can be improved through effort.

## Chapter II

## Review of the Literature

*The Achievement Goal Concept*

Achievement goals are a central construct in the achievement motivation literature. They refer to an individual's representation of competence based outcomes that they strive to attain or avoid (Cury, Elliot, Da Fonseca, & Moller, 2006). In this literature two main types of goals are often described: performance goals and mastery goals (e.g., Ames & Archer, 1988; Dweck, 1986, 1992; Nicholls, 1984). Mastery goals pertain to the desire to acquire knowledge and competence, the desire to improve and grow. Performance goals correspond to the desire to perform well compared with others. To be put more succinctly, mastery goals represent concern with gaining competence while performance goals represent concern with demonstrating competence.

More recent conceptualizations divide each goal into an approach and an avoidance component (Elliot, 1999; Elliot & McGregor, 2001), which is an attempt to integrate this work with earlier approach versus avoidance conceptualizations of achievement motivation (Atkinson, 1957; McClelland, 1951). This is known as the 2x2 model of goal orientation. The framework contains four achievement goals: mastery approach (focused on attaining task-based or intrapersonal competence), performance approach (focused on attaining normative competence), mastery avoidance (focused on avoiding task-based or intrapersonal incompetence), and performance avoidance (focused on avoiding normative incompetence). While earlier studies tended to focus on the distinction between mastery and performance goals, research in the last ten years has most often included the approach/avoidance distinction but for performance goals only.

Until recently, relatively few studies have incorporated the approach/avoidance distinction within mastery goals. However, in the cases where this distinction has been made it has been supported empirically by the means of differential correlates between the goals (Bipp, Steinmayr, & Spinath, 2008; Coutinho & Neuman, 2008; Howell & Burro, 2009), cluster analysis (Chai Liu, Wang, Tan, Ee, & Koh, 2009), and factor analysis (Elliot & McGregor, 2001; Murayama, Zhou, & Nesbit, 2009; Witkow & Fuligni, 2007).

Achievement goals represent the cognitive organization of one's behavior for a particular task. Much of achievement behavior can be understood through the type of goals that an individual employs in a learning situation (Elliot, 2005). Although this is an active area of research, it has been suggested that goals are still in need of an agreed upon conceptual definition (Elliot & Niesta, 2009). Therefore, the following definition has been recently suggested by Elliot and Niesta (2009) and will be adopted here, "a goal is a cognitive representation of a future object that an organism is committed to approach or avoid". In this conceptualization, a goal is not a variable to be put into a regression analysis to predict behavior, but it is the final cognitive verdict or the end for which behavior will be directed. In other words, goals themselves are not sufficient to account for motivation, but goals should be considered in tandem with the processes that underlie them to explain motivation. Some of the underlying processes that have been suggested are perceptions of competence, implicit theories, neurophysiological predispositions, and relational variables such as fear of rejection, competency-based variables such as need for achievement, as well as other demographic and environmental variables (Elliot, 1999).

### *Measurement of Goals*

Goal orientation among college students is measured by participant self report. researchers have done this most commonly utilizing a likert style format where subjects rate their level of agreement or disagreement with statements addressing goal content. There are several scales in wide usage that appear to differ primarily in the number and type of goals they measure. Some scales, such as The Goals Inventory (Roedel, Schraw, & Plake, 1994) measure only performance approach and mastery approach goals. This likert style scale was designed for use with adults and has been used primarily in achievement goal research among college students. The following are two items taken from the performance goal scale, “It is important for me to get a better grade than my classmates” and, “I like others to think I know a lot.” Examples from the mastery goal scale are, “I enjoy challenging school assignments” and, “Personal mastery of a subject is important to me”. Factor analysis of the two scales indicated that mastery goals and performance goals were statistically independent; two week test retest reliabilities were .73 for the performance scale and .76 for the mastery scale (Roedel et al, 1994).

Other scales, such Elliot and Church’s (1997) 18-item likert style Achievement Goal Questionnaire, were designed to measure performance avoidance goals in addition to performance approach and mastery goals. In this questionnaire, six items each assess mastery approach goals (e.g., “I want to learn as much as possible during this section of the class”), performance approach goals (e.g., “It is important for me to do better than other students on this exam”), and performance avoidance goals (e.g., “I just want to avoid doing poorly on this exam”).

Most recently, scales were designed to measure all four goals of the 2x2 framework, such as the Achievement Goal Questionnaire from Elliot & McGregor (2001). The scale has three items measuring each goal. An example of an item from each goal follows: performance approach, “It is important for me to do better than other students”, mastery approach, “I want to learn as much as possible from this class”, performance avoidance, “My goal in this class is to avoid performing poorly “and mastery avoidance, “Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like”. Confirmatory factor analysis from an undergraduate sample has resulted in four factors, one for each area of goal content (Elliot & McGregor, 2001). A small negative relationship was found between performance approach and mastery approach goals ( $r = -.14$ ), while endorsement of performance avoidance and mastery avoidance goals yielded a small positive correlation ( $r = .27$ ). The approach and avoidance valence of mastery goals are correlated with each other ( $r = .37$ ) as are the approach and avoidance valence within performance goals ( $r = .18$ ).

Research into the goal content of children and adolescents has required the development of different scales. In wide use is the Patterns of Adaptive Learning Survey (PALS; Midgley et al., 1997). The scale measures three types of achievement goals with five items measuring each goal in a likert style format: mastery approach (e.g., I like class work that I'll learn from even if I make a lot of mistakes) performance approach ( e.g., Doing better than other students in class is important to me) and performance avoidance (e.g., One of my main goals is to avoid looking like I can't do my work).

In addition to the use of the preceding scales, goal orientation can also be measured in an either/or format, as was the case with most of the early achievement goal

research. For example, Dweck & Mueller (1997) asked subjects to rate their agreement with the following statements, “Although I hate to admit it, I sometimes would rather do well in a class than learn a lot” or “It is much more important for me to learn things in my classes than it is to get the best grades.” Beyond simply presenting statements to subjects that pit mastery versus performance goals directly against each other, researchers have also classified goal content by the subject’s willingness to engage in particular tasks. For example, a subject’s goal preference can be obtained by giving them a choice between two tasks, where one task would assess their ability but not teach them anything new (i.e. performance goal task), while the other would give them the opportunity to practice and improve important skills (i.e. mastery goal task) (Dweck, 1999; Dweck & Legget, 1988). Other researchers have inferred a student’s willingness to take a remedial class, as evidence for a mastery goal orientation (Hong, Chiu, Dweck, Lin & Wan, 1999). These alternative methods for measuring goals have been used in only a minority of studies.

Most studies investigating goal orientation measure goals separately, using scales such as those previously described. This means that separate scores are obtained from subjects pertaining to their level of agreement with statements endorsing different achievement goals. Dependent measures are then correlated with these measures of goal content at a level of analysis that does not take into consideration one’s dominant goal orientation. In this way, it appears that what is being measured is the level of a person’s commitment to particular achievement goals in isolation and not their goal orientation. One’s dominant goal orientation is important as it was at the core of early work in the field, where differences in dominant goal orientation explained elementary student’s

responses to failure (Dweck & Legget, 1988). Since these studies have generally not been redone using the current likert style goal questionnaires, there is a danger of a discontinuity between past and present research. It is currently unclear the effect that this measurement and conceptual issue is having on the development of the field, as research examining the relationship of these either/or measurement methodologies with likert style measurements is lacking.

### *Effects of Goals*

The first wave of research investigating the correlates and effects of achievement goals was primarily focused on elementary school students and contained only the performance versus mastery distinction. The findings from these studies and their interpretations advanced the idea that mastery goals were generally adaptive while performance goals were generally maladaptive. For example, mastery goals, as opposed to performance goals, were touted to be related to higher levels of mastery-orientated behaviors such as persistence, increases in effort, increases in self-regulation, and intrinsic motivation (Dweck & Leggett, 1988; Utman, 1997, for reviews). These earlier studies tended to take an either/or approach to goal measurement that resulted in outcomes being related to the participant's dominant goal orientation. In contrast, current research has primarily tended to measure goals separately. It has also broadened its focus to achievement goals among college students and has used the approach/avoidance distinction. This research has produced more varied results, where performance goals are often found to be related to adaptive outcomes. Furthermore, the distinction between approach/avoidance within the 2x2 framework seems to be just as important as the

performance/mastery dichotomy. It is unclear as to whether these differences are attributable to changes in the manner that goals are measured, as studies measuring goals in an either/or fashion within the 2x2 framework are lacking. Lastly, researchers have learned that the relative effects and correlates of the four goal orientations appear to change with age, where performance approach goals appear to become more adaptive for adolescents and adults than they are for young children (Midgley, Middleton, & Kaplan, 2001). Therefore, in order not to confuse these issues, only the goal orientation research utilizing the 2x2 framework among college students will be reviewed here.

Among college students, mastery approach goals appear to be related to interest while performance approach goals are related to performance; avoidance goals in general tend to be associated with lower interest and lower performance. For example, in a university introductory psychology course mastery goals for the class predicted subsequent interest in the discipline but not grades, while performance goals for the class predicted subsequent grades but not interest (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000). Three semesters later the pattern was still followed; those who initially adopted a higher level of mastery goals tended to enroll in more psychology courses while those who initially adopted a higher level of performance goals tended to have better long-term academic performance as measured by GPA. This finding, that performance goals rather than mastery goals predict academic performance in college, has been replicated several times. Longitudinal research has found that goals for college work in general during a student's first semester predicted academic outcomes a full two years later, where after controlling for high school ability and the intensity of achievement motivation, performance approach goals were positively correlated with

GPA, performance avoidance goals were negatively associated with GPA, and mastery goals, while found to be unrelated to GPA, predicted a greater diversity in course selection (Durick, Lovejoy, & Johnson, 2009). Several others studies have produced this consistent pattern of results, where mastery goals are not related to objective measures of college performance (i.e. GPA), performance approach goals are positively correlated with GPA, and performance avoidance goals are negatively correlated with GPA. (Elliot et al, 1999; Fenollar et al, 2007; Hulleman, Durik, Schweigert, & Harackiewicz, 2008). Therefore, at the college level, performance approach goals cannot be considered completely maladaptive, as they are predictive of a central adaptive measure, GPA. However, although GPA is an important measure, so is actual learning, long-term retention, and mastery of the material. There is evidence to support the idea that performance goals, although associated with higher grades, may not be necessarily associated with higher retention of knowledge and skills.

There is evidence to suggest that, among college students, a performance approach goal orientation is associated with superficial processing, and a mastery approach orientation is associated with deep processing and/or better long-term recall. For example, in a sample of students enrolled in an undergraduate course in introductory statistics, self report measures of deep processing (e.g., "When I was reading, I stopped once in a while and went over what I had read.") were positively correlated with mastery approach goals as measured by The Goals Inventory (Roedel et al., 1994) but were found to be unrelated to a performance approach orientation (Bandalos, Finney, & Geske, 2003). Similarly, Elliot & McGregor (2001) measured both deep processing (e.g., "I treat the course material as a starting point and try to develop my own ideas about it") and

surface processing (e.g., "When I study for the exam, I try to memorize as many facts as I can") study strategies among a sample of 148 undergraduates enrolled in an introductory psychology course. These measures were related to goals as measured by the Achievement Goal Questionnaire (Elliot & McGregor, 2001). It was found that mastery approach goals were positively correlated with deep processing strategies, while no relationship was found between performance approach goals and deep processing. Most recently, Fenollar et al. (2007) administered a questionnaire to 553 undergraduate students in Spain enrolled in a wide variety of academic programs. Consistent with prior research, they found deep processing strategies to be positively related to mastery approach goals, no relationship to performance approach goal; surface processing was found to be related to performance approach goals but unrelated to mastery approach goals.

These findings would appear to make sense considering that for those who hold strong performance goals, where the purpose is demonstrating competence, surface processing of information could be an efficient way to prepare for a test and perform well, thereby meeting their goal. However, deep processing may not be the most efficient way to prepare for a multi choice test. This differential in study strategies may result in much of the association between grades and a performance approach orientation as well as the associations between mastery goals and greater long-term recall and interest in the subject. Performance approach goals, while predictive of GPA, may not be the most adaptive goal orientation in college.

In contrast to the unresolved question of the most adaptive approach goal in college, it appears that avoidance goals are linked with outcomes that would be widely

considered maladaptive. For example, in addition to the negative association between performance avoidance goals and GPA mentioned earlier (Elliot et al, 1999; Fenollar et al, 2007; Hulleman et al, 2008), researchers have found avoidance goals to be associated with other maladaptive behaviors. Howell and Buro (2009) measured goals using the Achievement Goal Questionnaire (Elliot & McGregor, 2001) among a sample of university undergraduates enrolled in an introductory psychology course. They found mastery avoidance goals to be correlated with self-reported procrastination, while mastery and performance approach goals were found to be inversely related to procrastination. Performance avoidance goals were found to be unrelated to procrastination. Also using the Achievement Goal Questionnaire, Elliot and McGregor (2001) found both performance avoidance and mastery avoidance goals to be related to self-reported measures of worry and disorganization, while being negatively related to self-reported SAT scores. Coutinho & Neuman (2008) also using a sample of university undergraduates and the Achievement Goal Questionnaire (Elliot & McGregor, 2001), found performance avoidance goals to be related to self-reported disorganization and surface processing. Mastery avoidance goals were not found to have a relationship to these measures.

#### *Situational versus Dispositional Goals*

The studies that were reviewed here all measured dispositional goal orientation, meaning goal orientation in the absence of an experimental manipulation. However, this is only part of the research on goals. Goals can be situationally manipulated and are therefore very context dependent. Experimental manipulations of goals have produced results comparable to dispositional goal orientation, where a mastery goal orientation is

related to higher levels of self-regulation and task persistence but not necessarily improved performance (Butler, 1993; Bouffard et al, 2005; Elliot, et al, 2005; Elliot & Dweck, 1988, Harackiewicz & Elliot, 1993).

Most notably, although conducted with children and not college students, Hole & Crozier (2007) performed an experimental manipulation to prime a mastery or a performance goal orientation among their sample, but before doing so they had measured the subject's dispositional goal orientation with the Patterns of Adaptive Learning Survey (Midgley et al, 1997). As a means of priming mastery goals, the children in one condition were told, 'In these tasks you will learn how to solve puzzles. It doesn't matter how many you get right, just enjoy it and you'll probably find you improve your skills as you go along'. In the performance condition, the children were told, 'These tasks test problem solving which is an important skill. Children who solve these tests are very good problem solvers. These tests will show how good you are at solving problems compared to other children your age so try to get the best score you can'. Consistent with prior research, the results indicated that those who were primed with a mastery goal orientation demonstrated higher levels of task persistence than those primed with a performance orientation. However, the important finding from the study was that when the results were analyzed from the standpoint of the children's dispositional goal orientation, no effects were found. Therefore, it appears that the subject's dispositional goal orientation, which prior research would suggest would lead to different levels of task persistence (Dweck & Legget, 1988), did not have an effect in this study due to the priming that the subjects underwent as part of the experimental manipulation. In other words, it seems as though the subject's dispositional goal orientations were outweighed by the direct prime

in the immediate context.

Although the goals ones chooses at any given time have been demonstrated to be context dependent, research indicates that individuals maintain a moderately stable dispositional tendency to favor a particular goal orientation from context to context. Research on the goal consistency of college students utilizing all four goals as measured by Elliot & McGregor's (2001) Achievement Goal Questionnaire found an overall goal consistency correlation of .76 over a 15 week long semester (Fryer & Elliot, 2007). In addition to this moderate temporal stability of goals, there is also evidence for cross-domain stability of goals. Bong (2001) utilizing a sample of Korean middle and high school students measured goals across four different domains, English, Korean, math, and science using the Patterns of Adaptive Learning Survey (PALS; Midgley et al., 1997). They found that performance approach and performance avoidance goals were moderately correlated across domains, while mastery goals were more distinct across domains. The cross-domain stability of college student's goals has yet to be investigated.

This research suggests that achievement goals, like most other social cognitive constructs, have both stability and flexibility across time and domains. However, what is the underlying psychological process that results in the consistency of goal orientation in the absence of a strong goal-priming directive in the immediate environment? It is this question in which we are primarily interested. Research has shown that achievement goals are unrelated to measures of intelligence and have only slight associations with measures of general personality such as the Big Five (Bipp et al, 2008; Payne, Youngcourt, & Beaubien, 2007). Currently, the most widely held theory on the origins of

dispositional goals contends that they are a result of one's implicit beliefs regarding the malleability of intelligence.

### *Implicit-Theories*

It has been proposed that an individual's dispositional achievement goal orientation stems from their implicit theory of intelligence (Dweck, 1999; Dweck & Leggett, 1988). In this model, individuals tend to adopt either an entity view of intelligence, meaning the idea that their intelligence is a fixed quantity and they could do little to change it, or an incremental theory of intelligence, the idea that their intelligence is not a fixed quantity and can be improved through effort. Implicit theories are measured using likert style self reports where subjects are asked to rate their level of agreement with statements such as, "You have a certain amount of intelligence and you really can't do much to change it" (Dweck, Chi-yue, & Hong, 1995). Implicit theories of intelligence have been shown to be generally unrelated to actual measures of intelligence (Dweck et al, 1995; Spinath & Spinath, 2003). They have shown a moderate level of stability over time, with correlations of  $r = .70$  from one year to the next and  $r = .64$  over three years among college students (Robins & Pals, 2002). They are approximately equally likely to occur, with about 40 percent endorsing an entity theory, 40 percent endorsing an incremental theory, and 20 percent being undecided (Dweck, 1999). Holding an incremental theory as opposed to an entity theory is associated with several adaptive outcomes among college students such as improved academic performance as measured by course grades (Aronson, Fried, & Good, 2002; Hong, et al, 1999), an increase in challenge seeking behavior (Hong et al, 1999), as well as more adaptive attributions (Hong et al, 1999; Robins & Pals, 2002).

The implicit theories approach is rooted in attribution theory (Wiener; 1986, 2005) where it is suggested that there exists three causal dimensions that are universal across human behaviors: locus, stability, and controllability. Based on these dimensions, as well as many other factors, attributions are made for ones success or failure such as effort, ability, luck, or task difficulty. It has been hypothesized that holding a particular implicit theory of intelligence would affect one's attributional style by biasing their attributions on the dimensions of stability and controllability (Dweck, 1999). After failure at a cognitive task, holding an entity theory would predispose one to attribute the failure to ability while holding an incremental theory would predispose one to attribute the failure to lack of effort. This relationship between implicit theories and attribution style has been supported empirically among samples of middle school (Blackwell, Trzesniewski, & Dweck, 2007) and college students (Hong et al, 1999; Robins & Pals, 2002).

It has long been proposed that goals are primarily a function of one's implicit theories (Dweck & Leggett, 1988). In this model an entity theory of intelligence is thought to produce performance goals while an incremental theory of intelligence is thought to produce mastery goals. As the model is explained by Dweck (1999), an individual with an entity theory thinks that their intelligence is generally unalterable, therefore the majority of tasks in school become measures of that immutable intelligence. This then leads one to become overly concerned with demonstrating to themselves and others that they have an adequate level of intelligence. Consequently, they become focused on either performance approach or performance avoidance goals. Conversely, a person who believes their level of intelligence to be malleable is not overly concerned by

a need to constantly demonstrate competence, because any deficit that may be apparent to others is viewed as being temporary and malleable. Instead, because they believe that it is possible to grow their intelligence, they are focused on just that, growing their intelligence and gaining competence. They are therefore more likely to adopt mastery goals in most academic situations.

### *Do Implicit Theories Drive Goals?*

Initially some evidence was put forth to support this hypothesis (Dweck & Leggett, 1988). The studies reviewed here all involved children and primarily measured goals in an either/or format where goals were pitted against each other. For example, as cited, Legget (1985) measured implicit theories of intelligence in a sample of junior high students along with the student's endorsement of one of three goals: the challenge seeking performance goal ("I'd like problems that are hard enough to show that I'm smart") and the challenge-avoidant performance goal ("I'd like problems that aren't too hard, so I don't get many wrong" or "I'd like problems that are fairly easy, so I'll do well") The actual wording of the challenge seeking mastery goal choice was not published in the review. It was found that 60 percent of those students who had endorsed an incremental theory also endorsed the mastery goal, while only 18 percent of the students who had endorsed an entity theory endorsed the mastery goal. While we don't know the content of the mastery goal item, it can be seen from the content of the performance goal items that the focus is on the level of difficulty and not necessarily the aim demonstrating competence. It should be noted that this is different from performance approach items on current goal scales, which actually focus on the demonstration of competence, such as, "It is important for me to do better than other students" (Elliot and McGregor, 2001).

This disconnection can be seen in another study cited as evidence for the hypotheses (Dweck & Bempechat, 1983). The study was reported to have categorized goal orientation based on student endorsements of the following task preference: mastery goals ("Hard, new, and different so I could try to learn from them") and performance goals ("Fun and easy to do, so I wouldn't have to worry about mistakes"). While the mastery goal in this case appears to be similar in content as the items on current scales of mastery approach goals, the performance goal task preference is not directly related to the aim of demonstrating competence. Lastly, research was presented in the review that suggested manipulations to ones implicit theories of intelligence have resulted in changes in their achievement goals (Dweck, Tenney, & Dinces, 1982). The manipulations consisted of reading passages to children that portrayed the intelligence of notable individuals (e.g. Albert Einstein) as either a fixed inborn trait or an acquirable quality. They found that the children who were read incremental theory prime were more likely to choose mastery goals for an upcoming task, while those who were primed with an entity theory were more likely to choose performance goals for the task. In addition to this initial review, it has subsequently been argued in other reviews of newer, mainly unpublished, manuscripts that there exists evidence for the claim that implicit theories are primary predictors of goal orientation (Dweck, 1999).

As a result of this work, the primary role of implicit theories in determining goal orientation seems to be generally accepted. This hypothesized relationship between implicit theories and goals has been widely cited in current research examining both goals and implicit theories (e.g., Aronson et al, 2002; Bong, 2008; Blackwell et al, 2007; Durik et al, 2009; Cury et al, 2006; Elliot, 2005; Hong et al, 1999; Mangels et al, 2006;

Niiya, 2004; Thompson & Musket, 2005). The wide spread acceptance of this hypothesized relationship may be hindering the exploration of other potential precursors of goal orientation.

It is only recently being acknowledged by some researchers that there has emerged little published empirical evidence for this claim since Dweck and Leggett's original 1988 review (Cury et al, 2006; Payne et al, 2007). A current search of the literature reveals that there appears to be only a few studies in refereed publications that directly address the issue of whether or not goals are primarily derived from implicit theories. In the first study (Roedel & Schraw, 1995), undergraduate students enrolled in an introductory course in educational psychology completed self-report scales measuring both their goal orientation for academics in general and implicit theory of intelligence. It was found that holding an incremental theory of intelligence was not related to an increase in the likelihood of adopting mastery goals as would be predicted by the model. The study did find a relationship between holding an entity theory of intelligence and adopting performance goals, however that relationship could be considered small ( $r = .21$ ).

The second study obtained self report measures of goals for the specific areas of math and social studies as well as implicit theories from 319 children enrolled in grades three to six in a predominately poor and working class school district in a large urban area. They found significant relationships between entity beliefs and both performance and mastery goals ( $r = .42$ ;  $r = .11$  respectively), which is in direct conflict with the theory that implicit beliefs predict goal choice, specifically the idea that entity beliefs would be negatively correlated with mastery goals (Stipek & Gralinski, 1996).

In contrast to these first two findings, Robins and Pals (2002) measured the implicit theories and goal orientation for academics in general in a sample of 508 undergraduates. They found that holding an entity theory was related to holding performance goals ( $r = .31$ ) but not mastery goals ( $r = -.25$ ), a result that supports the earlier findings from Dweck and Legget (1988). However, in contrast to the preceding two studies which measured goals separately, this study measured mastery goals in an either/or fashion based on the endorsement of a single item, "The knowledge I gain in school is more important than the grades I receive."

It should be noted that in these first three studies no performance avoidance or mastery avoidance goal options were given, which might have resulted in a lack of a clear association between implicit theories and goals. However, three separate tests of this association using the 2 x 2 model has still indicated little support for the idea that goals are primarily the result of one's implicit theory. These studies all used The Achievement Goal Questionnaire (Elliot & McGregor, 2001) as their measure of goal orientation.

In the first study, Elliot and McGregor (2001) measured goal orientation and implicit theories through self-report in a sample of undergraduate students from an introductory psychology class. It was found that all of the correlations between the four possible goals and implicit theories were very small, ranging from .19 to -.16. Only one of these correlations reached the level of statistical significance; mastery avoidance goals were inversely associated with an incremental theory. There was no association found between the holding of an entity theory and the adoption of either a performance or mastery goal orientation, which is direct contradiction to the hypothesis, as was the

nonsignificant and negative association between mastery approach goals and an incremental theory.

The second study (Cury et al, 2006) measured implicit theories and goal orientation through self-report in a sample of secondary students in France. They found that while an entity theory is correlated with the intensity of performance goals and an incremental theory was correlated with the intensity of mastery goals to a small degree ( $r = .20$ 's), the inverse was not true. Meaning, an entity theory was not related in any way to whether one adopts mastery goals and an incremental theory was not related in any way to whether one adopts performance goals. This is again in direct contrast to a key aspect of Dweck's model that suggests the idea that holding an entity theory makes one less willing to adopt mastery goals.

In the third and most recent test of the hypothesis (Howell & Buro, 2009) researchers measured implicit theories and goal orientation in a sample of university undergraduates enrolled in an introductory psychology course. They found very small correlations between implicit theories and goal orientations (between .14 and -.12) where the pattern of these correlations was such that an entity theory was significantly correlated with all four goal orientations and an incremental theory was negatively correlated with all four goal orientations. This finding, again, fails to support the model.

Perhaps recognizing the lack of evidence for the hypothesis in the some of the earlier studies, Dweck (1999) postulated that implicit theories will only predict goals when goals are "pitted" against each other and measured in an either/or fashion, as was the case in earlier studies (e.g., Dweck & Legget, 1988). This assertion is based on the

idea that one may hold relatively high levels of both performance approach and mastery approach goals, which can be adaptive for the individual when things are going well. It is only when a failure experience or other situation prevents both goals from coexisting that the importance of ones dominant goal orientation becomes evident, and it is in these situations were goals should have their greatest effect. In fairness, with the exception of the one study that supported the model (Robins & Pals, 2002) the other studies reviewed here measured goal orientation separately. Therefore it does remain a possibility that goals could be predicted by implicit theories if goals were measured in an “either/or” fashion, as it was in the original work supporting the hypothesis (Dweck & Legget, 1988). Although it is difficult to see how this relationship could exist given seemingly random pattern of correlations between goals and implicit theories in the most recent studies, it remains a possibility that which needs to be tested empirically.

Taken as a whole, the data in the published literature do not suggest that goals are primarily derived in a significant way from implicit theories. While it may be true that they could play some small role in goal orientation if they were measured in an “either/or” fashion, there remains a vast amount of room for another process orientated variable to account for the initial emergence, stability, and contextual malleability of dispositional goal orientation. Therefore, researchers ought to apply themselves to the task of determining what psychological processes underlie achievement goal orientation. While it has been established that implicit theories can exert an influence on achievement related behavior through attribution processes, it has not been established that this process is mediated by goal orientation. It is the current state of affairs that goal orientation appears to be without a viable psychological precursor.

*Self-Efficacy*

Self-Efficacy refers to an individual's perceived capabilities to learn or perform behaviors at a designated level. It has been formally defined as, "the beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997). It is a central concept in Bandura's social cognitive theory, which emphasizes reciprocal determinism and the effect that individuals have on selecting their own environments (Bandura, 1986). It will be argued here that, with some changes in measurement methodology, self-efficacy could be a primary determinant of achievement goals.

Unless individuals believe that they will be able to successfully engage in a task and obtain a desired outcome, they have little reason to initially engage in that task, let alone persist in the face of obstacles. Because of this, behavior can often be better predicted by one's self-efficacy beliefs than by their actual capacity to perform effectively (e.g., Zimmerman & Bandura, 1994). Evidence has been produced to support the idea that self-efficacy beliefs can be used to predict the tasks that individuals will chose to engage in (Bandura & Schunk, 1981; Escartí & Guzmán, 1999), as well as their long-term aspirations (Fouad, Smith, & Zao, 2002; Hackett & Betz, 1989; Lent, Brown, & Larkin, 1986; Zimmerman, Bandura, & Martinez-Pons, 1992). Furthermore, the difference between perceived self-efficacy and actual capacity helps explain how individuals with similar ability in a domain may differ widely in terms of performance and persistence. These effects of self-efficacy have been researched over many areas of human functioning. Metanalytic studies have been conducted in the domains of work related performance (Stajkovic & Luthans, 1998), psychosocial functioning (Holden,

Moncher, Schinke, & Barker, 1990), academic achievement (Multon, Brown, & Lent, 1991), health functioning (Holden, 1991), and athletic performance (Moritz, Feltz, Fahrbach, & Mack, 2000). This research demonstrates that self-efficacy is positively related to measures of motivation and performance across these divergent areas of human activity.

Specific to the academic domain, self-efficacy for academics is generally found to have a moderate relationship to achievement  $r = .38$ . Academic self-efficacy has also been found to relate to persistence and effort in the face of difficult academic tasks (Bouffard et al, 2005; Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk, 1981). Beyond self efficacy for academics in general, or a particular subject area or class, research has found that individuals hold self-efficacy beliefs for other academic related processes that can effect achievement, such as self regulated learning (Caprara et al, 2008) and creativity (Beghetto, 2006).

It is important to note that high levels of self-efficacy are not universally adaptive. Some research suggests that artificially high levels of self-efficacy can be negatively related to motivation and performance. This may be especially true when the self-regulatory processes involved consist of planning and preparation. For example, over estimates of self-efficacy have been shown to be associated with decreases in both planned and actual study time as well as academic performance (Vancouver & Kendall, 2006). If individuals over estimate their capacity to perform in a situation they may not recognize deficiencies in their preparedness and take the necessary steps to remediate them. Therefore, care must be taken not to blindly consider increases in self-efficacy to be universally adaptive and related to increases in motivation.

Individuals form perceptions of self-efficacy by interpreting information from four sources (Bandura, 1997). The most influential source is the interpreted result of one's prior experience, termed mastery experience. This means that an individual with a history of successful experiences with a task will tend to have a higher degree of self-efficacy for the task as opposed to an individual without such experiences or whose experiences were marked by failure rather than success. In addition to their interpretation of their own past mastery experiences, people can form self-efficacy perceptions through vicarious experience (Bandura, 1997). This source of self-efficacy information does not have as strong of an effect as do mastery experiences. However, it is especially important in situations where individuals may have limited personal experience, in which case they tend to become more sensitive to what others do. Vicarious experience tends to be more powerful when the person finds similarity with the model in a domain that would affect task performance. If the model is seen as being similar to the individual they are more likely to interpret the model's performance as being diagnostic of their own capacity. Self-efficacy can also be the result of social persuasion, or the verbal information they receive from other people (Bandura, 1997). Meaning, the feedback that individuals receive from others both positive and negative regarding their performance capabilities can increase or lower self efficacy. The last source of self-efficacy is that of somatic and emotional states (Bandura, 1997). Individuals can gain information about their competence from the emotional states they experience as they contemplate action. A strong emotional reaction provides information about the anticipated success or failure.

Self-efficacy can be measured at various levels of specificity. For example, a researcher could measure a student's general academic self-efficacy, their math self-

efficacy, their self-efficacy for calculus, or their self-efficacy for the particular calculus class that they are currently in. Research indicates that measures of self-efficacy will become more closely related to measures of performance and motivation the more specific the domain of self-efficacy that is measured (Choi, 2004; Pajares & Miller, 1995; Steinmayr & Spinath, 2009).

#### *Research on Achievement Goals and Self-Efficacy*

Research has investigated the relationship between self-efficacy and achievement goals in college students. Heish (2008) measured self-efficacy in 112 undergraduate students using the Patterns of Adaptive Learning Survey, a self-report scale that measured the student's level of perceived self-efficacy for academics in general. Measures of performance approach, mastery approach, and performance avoidance goals were obtained using the Achievement Goal Questionnaire (Elliot & Church, 1997). Both measures were administered in a single setting. Correlations were obtained between self-efficacy and mastery approach goals that were much higher ( $r = .60$ ) than those obtained between self-efficacy and performance approach goals ( $r = .24$ ). Both results were statistically significant. Performance avoidance goals were found to be unrelated to measures of self-efficacy. In other research, Bandalos et al. (2003) measured achievement goals in a sample of undergraduate students enrolled in an introductory statistics class using the Goals Inventory (Roedel et al, 1994). These results were then correlated with the results from eight self efficacy items taken from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & de Groot, 1990) and two original self-efficacy items, "I think I am naturally good at statistics" and, "Learning

statistics is easy for me.” This resulted in significant positive correlations between self-efficacy and both mastery ( $r = .38$ ) and performance goals ( $r = .14$ ).

A congruent pattern of findings has emerged from studies with high school students that utilized similar methodologies (Liem, Lau, Shun, & Nie, 2007; Long et al, 2007). In both of these studies, the sections of Patterns of Adaptive Learning Survey which measured achievement goals were used to measure performance approach and mastery approach goals. Both studies used original scales of self-efficacy. As was the case with college students, self-efficacy was found to be related to both performance approach and mastery approach goals, with the correlation between self efficacy and mastery approach goals being stronger than the relationship between self efficacy and performance approach goals.

Other research utilizing undergraduate students has yielded somewhat different results, where positive correlations were obtained between self-efficacy and mastery approach goals but not between self-efficacy and performance approach goals. Phillips and Gully (1997) measured goal orientation among a group of 405 undergraduate students recruited from management and psychology courses using two 8-item scales measuring mastery and performance goals (Button, Mathieu, & Zajac, 1996). An original 10 item measure of self-efficacy was used. Both measures were administered at a single point in time. Positive correlations were obtained between self-efficacy and a mastery goal orientation but insignificant correlations were obtained between self-efficacy and a performance goal orientation.

More recent research utilizing the full 2 x 2 framework found that self-efficacy was related to both mastery and performance goals in approach but not avoidance form.

Coutinho and Neuman (2008) measured goal orientation using the Achievement Goal Questionnaire (Elliot & McGregor, 2001) and self-efficacy using the nine-item self-efficacy subscale from the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & de Groot, 1990) in a sample of undergraduate university students enrolled in an introductory psychology course. Significant positive correlations were obtained between the self-efficacy measure and both performance approach goals ( $r = .36$ ) and mastery approach goals ( $r = .32$ ). Negative correlations were obtained between self-efficacy and mastery avoidance goals ( $r = -.24$ ) and performance avoidance goals ( $r = -.04$ ).

To summarize, among college students, most studies report that self-efficacy is related to both forms of approach goals, where the relationship between mastery approach and self-efficacy is stronger than the relationship between performance approach and self-efficacy. In studies utilizing the 2x2 goal framework, self efficacy was found to be related to both types of approach goals and inversely related to both types of avoidance goals. Given these findings and the design of these studies we might ask how the present state of research has led to theoretical advancement. It appears that it has largely failed to bring about an improved theory of achievement motivation that integrates these two central constructs. While we have correlational data regarding these constructs, we do not know how these two processes interact to produce their effects on achievement behavior. A understanding of this relationship would lead to a more accurate theory of achievement motivation, which in turn could aid the development of more effective educational practices and interventions.

The absence of a theory that integrates both constructs may be due to the measurement and data analysis methodologies that have so far been employed. First, it should be highlighted here that in these studies the goals were not placed against each other in an “either/or” format but were assessed separately using an interval scale of measurement. Their relative magnitudes were correlated with the degree of self-efficacy for the task in general, resulting in a positive correlation between the two constructs that may likely be a measurement of a latent variable such as general commitment towards academics. Therefore, based on this type of design, it appears that goal orientation would get a positive correlation with self-efficacy no matter what the content of the approach goal because what is actually being measured is the degree of commitment to that goal and not the content of the goal. This being the case, previous research has not properly investigated the question as to whether self-efficacy could be a significant cognitive precursor of goal choice. It remains to be seen what the nature of the relationship between self-efficacy and goals would be if the data were analyzed in a manner that compared self-efficacy with dominant goal orientation. This would address the question of self-efficacy’s relationship to goal content and not just commitment, which would be necessary for any meaningful theoretical integration of the constructs.

In addition to measuring goals in an either/or fashion, it is suggested here that adjustments will need to be made in the way in which self-efficacy is being measured. The self-efficacy items in the preceding studies appeared to vary greatly as to what they were measuring self-efficacy for. Consider the sample self-efficacy item given from Phillips and Gully (1997), "I feel confident in my ability to perform well on the upcoming exam," as opposed to the sample item provided from Liem et al. (2008), "I am

sure I can learn the skills taught in English class well.’’ The content of these items are not the same. The first item appears to be addressing the content of ones’ self-efficacy to perform based upon an external standard, to demonstrate their competence on the “upcoming exam,” while the second appears to be measuring ones’ self-efficacy to increase their competence over time. Can there be differences between one’s self efficacy to demonstrate competence relative to others in a specific context and their self-efficacy that they will improve their skills over a period of time? Do items such as these represent separate, albeit related, domains of personally efficacy? Other items seem to be more ambiguous in terms of the focus of self-efficacy beliefs such as, “I think that I am naturally good at statistics” (Bandalos et al, 2003). When faced with such items, do students interpret the word “good” as referring to their perceived ability to learn more in the future or do they interpret it as referring to their capacity to demonstrate their competence on an upcoming exam? The answer is not clear. However, addressing this specificity issue in the measurement of self-efficacy as it relates to achievement goals will be necessary for a meaningful integration of the constructs. It may be the case that the measures of self-efficacy need to move to a new level of specificity, that is, specific to the goal at hand and not simply the task. In other words, if goals are so important in directing our behavior, why measure self-efficacy for the task (the class that is being taken) and not the particular goal that one brings to the task (e.g., self efficacy for mastery approach goals)?

#### *Goal Specific Self-Efficacy as the Driver of Goals*

It may be reasonable to posit that goal orientation is the result of the relative levels of goal specific self efficacy that one holds. Meaning, an individual in a particular

context may select a performance or a mastery goal of an approach or avoidance valence based on their degree of self-efficacy that they will be successful in obtaining that goal as compared to an opposing goal. All other factors being equal, when given a choice people will generally engage in a task for which they believe that they have the highest likelihood for success, the task for which they hold the highest degree of self-efficacy (Bandura, 1997). Once it is recognized that the “task” in the self-efficacy literature, from the point of view of the subject, includes the goal they bring to the activity and not just the activity in itself, then it is logical to postulate that goal choice is influenced by the same processes as task choice. The choice of goal content may be viewed simply as a higher level of task specificity to which the research on self-efficacy can be applied.

While it is true that self-efficacy has usually been studied at the level of the task (i.e. perceived self-efficacy for mathematics), the conceptual definition given by Bandura refers to ones capabilities to “produce given attainments”. Therefore, conceptually speaking, self-efficacy is directed at particular attainments within the activity and not simply the activity in itself. However, it is common practice for researchers to label their measures as describing one’s self-efficacy for the achievement situation without reference to goals (i.e. self-efficacy for mathematics). This may be an error, as mathematics is a discipline of study and not, as defined by Bandura, an “attainment”. It ought not to be referred to as self-efficacy for a discipline of study, which also fails to make grammatical sense, but self-efficacy to achieve particular attainments within discipline related activities, such as the demonstration of current competence or the growth of competence. Given this, there appears to be a disconnection in the manner in which self-efficacy scales are labeled and described from their content, as often times the

scale items make some direct reference to a specific achievement goal. For example, some studies from the current literature review have self-efficacy items that appear to accessing the construct of self efficacy for mastery approach goals, “‘Even if the work in English is hard, I can learn it’ or ‘I am sure I can learn the skills taught in English class well.’” (Liem et al, 2007). Other studies have self efficacy items that seem to be measuring self efficacy for performance approach goals, as they contain an evaluative component, “I am sure that I could do an excellent job on the problems and tasks assigned for math class” (Bong, 2008) or from Phillips and Gully (1997), "I feel confident in my ability to perform well on the upcoming exam".

It would be expected that if self-efficacy were measured for each of the goals in the 2x2 framework, the goal with the highest level of self-efficacy will be the goal that will be selected in an “either/or” format. Meaning, if a person had to make a choice between a mastery approach and a performance approach goal, the goal chosen would be the goal for which the person had the highest degree of self-efficacy. For the avoidance goals, since the valence is reversed, the lowest degree of self-efficacy would indicate a need to adopt the avoidance goals. Therefore, it would be predicted that the absolute value of the measures of goal specific self-efficacy would predict goal choice, where the goal chosen by an individual in a particular situation would be the goal for which exists the greatest absolute value of goal specific self-efficacy.

In this model, for a change to occur in the goal orientation brought to a task, the level of self efficacy for the new goal would not necessarily have to increase, but rather the relative level of self efficacy for that new goal would have to become highest in value

as compared to the other possible goals for the situation. The onset of the adoption of a performance avoidance goal may follow an event where an individual's self efficacy for mastery approach and/or performance approach goals have been lowered. To illustrate, consider a student with a high degree of self-efficacy for performance approach goals as compared to the other three possibilities in the 2x2 framework. The student then enrolls in an advanced class where the new classmates are at a level of skill that is much higher than the student's perceived level of skill. The student's self-efficacy for a performance approach goal in this situation has decreased significantly based on his appraisals of the skills of the new classmates and the recognition that the grades will be handed out on a curve. Due to these vicarious judgments, the student has lost confidence in his ability to outperform others. The student's self-efficacy for performance approach goals is no longer dominant, and the student therefore ceases to adopt performance approach goals in the class. The goal that would take its place would be the goal that would then hold the highest degree of perceived self-efficacy after the decline in the student's self-efficacy for performance approach goals. It may be the case that the student is not threatened by the new highly skilled classmates and generally has a high level of self-efficacy for mastery approach goals, brought about by his numerous mastery experiences working hard for the purpose of increasing his academic competences in various areas. This being the case, the student would adopt mastery approach goals as this has the highest relative level of goal specific self-efficacy. However, it could also be supposed that his level of mastery approach goals may not have been as high as his lack of self-efficacy for performance avoidance goals. In such a situation, the individual may adopt a performance avoidance goal as a consequence of the decrease in self-efficacy for the performance approach goal.

*Experimental Link between Implicit Theories and Goals*

While most associational studies published after Dweck and Leggett's (1988) original review have not found a reliable relationship between implicit theories and goals, evidence from subsequent experimental studies has provided evidence that appears to link the two constructs. The results of these experimental studies will need to be accounted for within the current framework. The findings from Dweck, Twenny, and Dinces' 1982 study (cited in Dweck and Leggett's 1988 review) have been reinforced by two subsequent studies utilizing similar experimental methodologies (Cury et al, 2006, Hong et al, 1999).

As described earlier, Dweck, Twenny, and Dinces (1982) report to have manipulated children's theories of intelligence by reading passages to them that portrayed the intelligence of notable individuals (e.g., Albert Einstein) as either a fixed inborn trait or an acquirable quality. They found that the children who were read an incremental theory prime were more likely to choose mastery goals for an upcoming task as compared to those who were primed with an entity theory. Conversely, the reading of the entity theory prime resulted in a higher likelihood of choosing performance goals for the upcoming task.

Curry (et al, 2006) produced a similar finding within a sample of middle school students. The students were administered the Coding subtest from the Wechsler Intelligence Scale for Children: Third Edition. Before the test, the students were divided into two conditions. Those in the entity theory condition were informed: In many studies,

scientists have shown that: 1) Everyone has a certain level of this type of ability, and there is not much that can be done to really change it, 2) This type of ability depends on gifts or qualities that one has from birth, 3) Even if one makes an effort, one cannot really change one's ability level, and 4) This type of ability is not really modifiable. In contrast, those in the incremental theory condition were informed: In many studies, scientists have shown that: 1) Everyone has a certain level of this type of ability, but there are a lot of ways to substantially change it, 2) This type of ability does not depend on gifts or qualities that one has from birth, 3) If one makes an effort, one can change one's ability level, and 4) This type of ability is quite modifiable.

After the manipulation, the subjects were given five minutes to practice the Coding subtest. The subjects were then administered the test and their results were scored. It was found that performance on the test was higher in those who were in the incremental theory condition than it was for those in the entity theory condition. It was also found those in the entity theory condition adopted higher levels of performance approach and performance avoidance goals as measured by the Achievement Goal Questionnaire (Elliot & McGregor, 2001) than did those in the incremental theory condition. The authors interpreted these findings as providing evidence that implicit theories drive goal orientation.

In adults, Hong et al (1999) reported to manipulate theories of intelligence by having subjects read psychology today type articles that argued for either an entity theory of intelligence or an incremental theory. For example, this section is taken from the entity theory condition:

Knowles spent the last decade tracing identical twins who were raised apart. . . . According to Knowles' results, up to eighty-eight percent of a person's

intelligence is due to genetic factors. About ten percent of intelligence seems to be determined during the first three years of life. This means that intelligence may be increased or decreased by only about two percent during most of a person's life.

The following was taken from the incremental theory condition:

Knowles spent the last decade tracing identical twins who were raised apart. . . . According to his results, up to 88 percent of a person's intelligence is due to environmental factors. In an extreme case, a young girl adopted by a college professor and his wife had an IQ of 138. The genetically identical twin was raised by the real mother, who was a prostitute. This girl had an IQ of 85.

Afterwards the subjects were asked whether they preferred to engage in an easy task or a relatively difficult and challenging task. The subjects in the in the entity theory condition were more likely to prefer an easy task as compared to those in the incremental theory condition. Furthermore, after completing a cognitive task and receiving unsatisfactory feedback, it was found that those in the incremental theory condition were more likely to accept an invitation to do remedial work than those in the entity theory condition. Formal achievement goal scales were not given, however the subjects choices regarding task selection and willingness to remediate poor performance were interpreted as being indicative of goal orientation.

To summarize, these studies reported to manipulate implicit theories by presenting authoritative arguments to the subjects regarding whether an entity or an incremental theory was supported by scientific evidence. The subjects who were exposed to arguments in favor of the scientific validity of an entity theory tended to report more performance goals on subsequent self-reports and failed to select tasks that may be difficult or highlight their weakness. In contrast, subjects who were exposed to arguments in favor of the scientific validity of an incremental theory tended to report increased adoption of mastery goals, were more willing to engage in difficult tasks, and

were more willing to engage in remedial work to address their perceived weaknesses. These studies have been interpreted as providing evidence that achievement goals stem from implicit theories of intelligence.

The hypothesis that an actual change in implicit theories caused the changes in goal orientation is not the only explanation for these effects, nor is it the mostly likely. These differences in goal orientation may have been due to changes in the subject's goal specific self-efficacy rather than changes in their implicit theories. Since verbal persuasion has been shown to effect one's degree of self-efficacy (Bandura, 1997), it could be contended that those subjects who heard from an authoritative source that their performance could likely be improved experienced an increase in their degree of self-efficacy for mastery approach goals. In contrast, those who were lead to believed that their performance will be indicative of a fixed trait, would therefore likely experience a decrease in their degree of self efficacy for mastery approach goals.

In this framework, it would be predicted that the priming of an incremental theory in the manner similar to that which was done in the aforementioned studies would result in an increase in self-efficacy for mastery approach goals. It would be further predicted that such an increase would account for any increase in mastery approach goal adoption following the manipulation. Conversely, it would be predicted that the priming of an entity theory would result in a decrease of self-efficacy for mastery approach goals. Furthermore, it would be predicted that such a decrease would account for any decrease in mastery approach goal adoption following the manipulation.

### *Goal Specific Self-Efficacy and Implicit Theories*

Lastly, the potential relationships between implicit theories and the various domains of goal specific self-efficacy will need to be addressed. The only hypothesis that will be made here pertains to the potential relationship between an incremental theory of intelligence and self-efficacy for mastery approach goals. It would be expected that having a high degree of self-efficacy for mastery approach goals would necessitate an incremental theory of intelligence. However, the opposite would not be true, having a low degree of self-efficacy for mastery approach goals would not necessarily affect ones theory of intelligence. In this case, it could be imagined that a person with a low degree of self-efficacy for mastery approach goals could hold an incremental theory while blaming some other factor other than the malleability of their intelligence for their lack of efficacy. It could easily be imagined that an individual may endorse an entity theory due specifically to their low self-efficacy for mastery approach goals, where the change in implicit belief acts as a means to save their self-concept and reduce cognitive dissonance. Therefore, in this model it would be expected that individuals with a high degree of perceived self-efficacy for mastery approach goals would tend to adopt an incremental theory of intelligence at a frequency that is higher than those holding low or moderate levels of self-efficacy for mastery approach goals. Based on the lack of prior research into goal specific self-efficacy, no other predictions regarding the relationship between levels of goal specific self-efficacy and implicit theories can be made.

### *Advantages of the Proposed Model*

If empirically supported, a model of goal orientation based on goal specific self-efficacy would have three main theoretical advantages over a model where goal

orientation is a result of implicit theories. First, goal specific self-efficacy ought to be a very dynamic construct that would account well for both the temporal stability and malleability of achievement goals. A person's relative level of self-efficacy for the four goal orientations could rise and fall depending on influences from the sources of self-efficacy that could be easily affected over a short period of time. In contrast, the idea that goals are derived from implicit theories cannot account as well for changes in one's goal orientation in a particular area over time without suggesting that their implicit beliefs are rapidly fluctuating over time.

The second theoretical advantage of this model is that goal specific self-efficacy could better account for differences in goal orientation across academic subject areas (e.g. Bong, 2001) . For example, if an individual were an entity theorist, what would explain the fact that such a person may hold a performance approach goal in geometry, a mastery avoidance goal in algebra, and a mastery approach goal in science? However self-efficacy theory has no problem in dealing with these changes across domains, as self-efficacy research has shown that the construct to be task specific (Bandura, 1997). In the current model, it would be expected that the different achievement goals a student may hold for each of their courses would be accompanied by a different profile of goal specific self-efficacy.

The final theoretical advantage of this model is that it would result in more adaptive goal choices for the individual. If individuals pursued goals that are primarily based on their implicit beliefs there is no reason to assume that those goals would be the most adaptive. Since implicit beliefs are not based on individual differences in functional

capacity or the affordances of the environment, what adaptive purpose would be served by these implicit beliefs driving goals and consequently behavior? In other words, if implicit beliefs drove goal choice it would be difficult to see how such a mechanism of action would tend to result in the most adaptive goal choice in the context of the individual and the situation. This is the exact opposite of a model in which relative values of self-efficacy are resulting in goal content. For the reasons that have just been stated, temporal and situational flexibility, a mechanism based on the relative degree of goal specific self-efficacy would provide the individual with a goal orientation that is responsive to context.

### *Hypotheses*

The following hypotheses will be addressed by this study:

1. Can goal specific self-efficacy be used to predict achievement goal adoption?

H<sub>1a</sub>: Goal specific self-efficacy will not be independent of achievement goal adoption.

Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self-efficacy.

2. Are implicit theories related to achievement goal adoption, and what is the degree of that relationship relative to the construct of goal specific self-efficacy?

H<sub>2a</sub>: Implicit theories will not be independent of achievement goal adoption.

Specifically, participants with an entity theory of intelligence will endorse performance approach and performance avoidance goals at a higher frequency than they will endorse mastery approach or mastery avoidance goals.

H<sub>2b</sub>: Implicit theories will not be independent of achievement goal adoption.

Specifically, individuals with an incremental theory of intelligence will endorse mastery approach and mastery avoidance goals at a higher frequency than they will endorse performance approach or performance avoidance goals.

H<sub>2c</sub>: Goal specific self-efficacy will be a better predictor of achievement goal orientation than implicit theories.

3. What is the nature of the relationship between implicit theories and ones degree of goal specific self-efficacy?

H<sub>3a</sub>: Participants with an incremental theory of intelligence will report higher levels of mastery approach goals than those who hold an entity theory.

4. To what extent do student's achievement goals differ across the classes in which they are enrolled in a semester, and are these differences associated with congruent changes in their profile of goal specific self-efficacy?

H<sub>4a</sub>: For those individuals who hold different goals for the classes in which they are enrolled, goal specific self efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self-efficacy.

5. Can the effects of manipulations to one's theory of intelligence on goal orientation be explained by changes in the degree of ones self-efficacy for mastery approach goals?

H<sub>5a</sub>: Within the sample of those exposed to the manipulation of their implicit theory, goal specific self efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal in which the participant holds the highest degree of self efficacy.

H<sub>5b</sub>: Individuals who are primed with an incremental theory of intelligence will

report a higher degree of self-efficacy for mastery approach goals than individuals who were primed with an entity theory of intelligence.

H<sub>5c</sub>: Participants primed with an entity theory of intelligence will report performance approach and performance avoidance goals at a higher frequency than those participants primed with an incremental theory of intelligence.

H<sub>5d</sub>: Participants primed with an incremental theory of intelligence will report mastery approach and mastery avoidance goals at a higher frequency than those primed with an entity theory.

H<sub>5e</sub>: Measures of goal specific self-efficacy will be a better predictor of achievement goal orientation than the implicit theory manipulation.

## Chapter III

## Methodology

*Introduction*

The methods used to collect and analyze the data for the present research are presented in this chapter. Two studies were conducted to address the research questions. Study 1 addressed research questions one through four. Study 2 addressed the fifth research question. The participants, methodologies, and variables for each study are presented separately. Following this, the data collection procedures for both studies are presented jointly.

*Restatement of the Problem*

Achievement goals have a degree of stability across time and domain while simultaneously demonstrating a degree of situational malleability. Since the goals that one adopts in an academic context have been shown to be associated with, as well as causally related to, important outcomes, it is a priority for researchers to understand their origins, specifically the sources of their stability and malleability. Currently, the most widely accepted theory holds that achievement goals are the result of one's implicit theory of intelligence. However, there is a paucity of empirical support for this assertion, which, when added to the construct's inherent lack of ability to account for the contextual malleability of goals, requires the exploration of alternative psychological precursors for achievement goal orientation. The current study tested the hypothesis that goal specific self-efficacy is the primary driver of achievement goals.

### Study 1 *Research Design*

This study employed an associational research design utilizing data from several measures taken at a single point in time. Measures of goal specific self-efficacy, implicit theories of intelligence, and achievement goals were obtained. Demographic measures and a measure of self-perceived course relevancy were also obtained. The relationships between these variables were analyzed using chi-square tests of independence and *t* tests of independence.

#### *Participants*

For study 1, the participants were 203 undergraduate students enrolled in a local community college. Age was the only exclusionary criteria. Participants needed to be 18 years of age.

#### *Instruments*

##### *Goal Specific Self-Efficacy*

The items for the goal specific self-efficacy scales were modified from the Achievement Goal Questionnaire, a frequently employed measure of goal orientation in the 2x2 framework (Elliot & McGregor, 2001). The modification consisted of altering the items to make them read as self-efficacy items instead of goal items and making the items course specific. For example, the original item, “it is important to me to do better than other students” was transformed into, “I am confident that I could do better than most other students in this class.” The participants responded to each item on a scale of 0 to 100, indicating their degree of agreement with the statements as far as they pertain to a particular course in which they are currently enrolled.

The items are as follows: self-efficacy for performance approach goals (“I am confident that I could do better than most other students in this class”, “I think that I could do well compared to others in this class”, “I am confident that I could get a better grade than most of the other students in this class”), self efficacy for mastery approach goals (“I am confident in my ability to learn as much as possible from this class.”, “I am confident that I could gain a thorough understanding of the content of this class”, “I think that I could master the material presented in this class”), self-efficacy for performance avoidance goals (“I may not be able to avoid doing poorly in this class”, “I am unsure of my ability to avoid performing poorly in this class”, “I have little confidence that I could avoid performing poorly in this class”, and self-efficacy for mastery avoidance goals (“I don’t think I will be able to learn all that I should in this class”, “I have little confidence that I will be able to understand the content of this class as thoroughly as I’d like”, “I doubt that I will be able to learn all that there is to learn in this class”).

While this goal specific self-efficacy scale is a new instrument, the content of the items as phrased as a measure of goal orientation has been shown to be reliable and valid. Factor analysis yielded internal consistency coefficients for items on the performance approach scale that ranged from .97 to .90, the mastery approach scale ranged from .91 to .80, the performance avoidance scale from .87 to .74, and the mastery avoidance scale ranged from .90 to .84. No general factor was found (Elliot & McGregor, 2001). Since, for theoretical reasons detailed earlier, the concept of goal orientation and goal specific self-efficacy are thought to be closely linked, it would be expected that altering the goal items to read as self-efficacy items will not result in large changes to the factor structure.

### *Goal Orientation*

In this study goal orientation was measured in an “either/or” fashion. This was for two reasons. The first reason, as explained earlier, is to more accurately address the question of how self-efficacy affects the choice of goal content and not just goal commitment. This is most easily done by collecting data that is categorical rather than metric, which would preclude the use of the widely used metric scales such as the Achievement Goal Questionnaire (Eliot & McGregor, 2001). The second reason is to assess the relative predictor power of self-efficacy for goals over implicit theories in a manner that is responsive to criticism of earlier studies that measured goal orientation separately instead of in manner that “pitted” the goals against each other (Dweck, 1999).

The performance approach and mastery approach items were modeled after the measure used in Dweck and Mueller (1997). The performance avoidance and mastery avoidance items were created here to run counter in meaning to the approach goals. To our knowledge there are no instruments in use that measure avoidance goals in an either/or manner. These items had to be created for use in the current study.

The participants were asked to endorse only one of the four goal options as the one that is most characteristic of themselves for a particular class. The goal options were as follows: performance approach, “Although I hate to admit it, I would rather do well in this class than learn a lot”, performance avoidance, “I would rather avoid looking like I don’t understand than learning as much as I could in this class”, mastery approach, “It is more import for me to learn as much as I could in this class than it is to get the best grades”, and mastery avoidance, “Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I’d like”.

As in the original goal items (Dweck & Mueller, 1997) the content of the performance approach and mastery approach items make direct reference to each other. These two goals are contrasted at the both the level of scale, which requires the subject to select only one goal, and at the item level which separates the goal choices by the use of the word “rather”. It was thought that this same format should be used in the construction of the avoidance goal items. The approach and avoidance goals are already inherently pitted against each other through the valence of the sentence. However, the avoidance goals still needed to be contrasted with their mastery or performance counterpart. Therefore, within the mastery avoidance item, direct reference was made to mastery avoidance goals being more important than performance approach goals, and within the performance avoidance item, direct reference was made to performance avoidance being more important than mastery approach. Therefore at the level of the goal items each goal is contrasted against the other three. The only exception to this is that mastery avoidance is not directed contrasted at the level of the individual item to performance avoidance goals. This could not have been accomplished without the avoidance goals having more comparisons than the approach goals. It was thought that symmetry in the goal choices was more important than making this distinction.

### *Implicit Theories*

Implicit theories were measured with the Theories of Intelligence Scale (Dweck, Chi-yue, & Hong, 1995). The scale contains the following three items, "You have a certain amount of intelligence and you really can't do much to change it", "Your intelligence is something about you that you can't change very much", and "You can learn new things, but you can't really change your basic intelligence." Participants were

asked to indicate their degree of agreement with each item on a 6-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). Thus, the higher the participants' scores, the less they believed that intelligence is a fixed entity. This measure was scored by obtaining a mean from the ratings on the three items that produced an overall implicit theory score (ranging from 1 to 6). A high score would indicate the adoption of an incremental theory and a low score would indicate the adoption of an entity theory. To ensure that only participants with a clear preference for a particular theory of intelligence were included in the analysis, mean scores of 3 or under are considered indicative of an entity theorist while scores of 4 or above are considered indicative of an incremental theorist. Data from subjects whose mean falls between 3 and 4 were placed into an undecided category.

The results of six separate validation studies on the scale have been published by Dweck et al. (1995). Internal consistency of the scale across the studies was found to range from .94 to .97 and the two-week test retest reliability was found to be .80. In regards to discriminate validity, among adults, the scale produced nonsignificant correlations with age, gender, cognitive ability as measured by SAT scores, political attitudes, and self-esteem.

#### *Additional Measures*

In addition to the psychological instruments listed above other items were included to gather background information. A single item, "Is this class relevant to your major course of study", was obtained to ascertain the relevance of the class to the individual. Demographic data regarding gender was also collected.

*Data Analysis*

The data collected from the instruments was entered into a computer for analysis using Minitab Windows version 16.0. All decisions on the statistical significance of the findings were made using an alpha level of .05. Figure 1 presents the planned statistical analyses to address the hypotheses in this study. The Data Analysis will be broken up into four sections, each pertaining to one of the research questions and subsequent hypotheses.

The first section addresses the hypothesis that goal specific self-efficacy will predict achievement goal adoption. The data was processed in the following manner. Each participant obtained a composite score for each of the following four subscales by adding the three items together in each subscale: self-efficacy for mastery approach goals, self-efficacy for performance approach goals, self-efficacy for performance avoidance goals, and self-efficacy for mastery avoidance goals (note that the valence for the avoidance goals are reversed so that a low level of self-efficacy will result in a high score). Each participant had their scores on these four subscales compared to each other. As a result of that comparison, the participants' highest score determined their placement into one of four groups: 1.) participants whose highest score was obtained on the self-efficacy for mastery approach goals subscale, 2.) participants whose highest score was obtained on the self-efficacy for mastery avoidance goals subscale, 3.) participants whose highest score was obtained on the self-efficacy for performance approach goals subscale, and 4) participants whose highest score was obtained on the self-efficacy for performance avoidance goals subscale. Participants whose highest score was not at least

ten points higher than their second highest score were excluded from the analysis, as they do not have a clear dominant area of goal specific self-efficacy.

Once the subjects were divided in this manner, the four groups were compared on the dependent variable, the goal choice items on the survey. For each of the four groups, a frequency score for each of the goal orientations was obtained.

Differences between the groups were analyzed using a chi square test of independence.

The next section addressed the association between implicit theories and goals. The data from the Implicit Theories of Intelligence scale were used to place each participant into one of two groups, entity theorist or incremental theorist, based on the conventions of the scale described earlier. These two groups were compared on the frequency of the dependent variable of goal orientation. A chi-square test of independence was used to analyze differences in the frequencies.

The following section addressed the research question pertaining to the relationship between goal specific self-efficacy and implicit theories. T test were used to analyze the differences in levels of self-efficacy for mastery performance goals between two groups, those endorsing an entity theory and those endorsing an incremental theory of intelligence.

The concluding analysis for the first study addressed the question as to what extent do student's achievement goals differ across the courses in which they are enrolled and if these differences are associated with congruent changes in their profile of goal specific self-efficacy. Participants who are enrolled in other courses in addition to the course in which the data is being collected were asked to complete an additional measure of goal specific self-efficacy and goal orientation for each of those other courses.

Descriptive data regarding the prevalence of holding different goals for each class was obtained. Data from participants who are enrolled in more than one course for which they hold different goals were analyzed for concurrent changes in goal specific self-efficacy.

Figure 1

## Statistical Analysis

## Study 1

Research Questions/Hypothesis	Variables	Statistical Analysis
1. Can goal specific self-efficacy be used to predict achievement goal adoption?		
H <sub>1a</sub> : Goal specific self-efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self efficacy.	Goal Specific Self Efficacy Achievement Goal Orientation	Chi-square tests of independence will be used to analyze the differences in frequencies.  If significant differences in the frequencies exist, post hoc analysis using the standardized residual e will be used to determine the effects of individual cells.
2. Are implicit theories related to achievement goal adoption, and what is the degree of that relationship relative to the construct of goal specific self-efficacy?		
H <sub>2a</sub> : Implicit theories will not be independent of achievement goal adoption. Specifically, participants with an entity theory of intelligence will endorse performance approach and performance avoidance goals at a higher frequency than they will endorse mastery approach or mastery avoidance goals.  H <sub>2b</sub> : Implicit theories will not be independent of achievement goal adoption. Specifically, individuals with an incremental theory of intelligence will endorse mastery approach and mastery avoidance goals at a higher frequency than they will endorse performance approach or performance avoidance goals.  H <sub>2c</sub> : Goal specific self-efficacy will be a better predictor of achievement goal orientation than implicit theories.	Goal Specific Self-Efficacy Implicit Theories Achievement Goal Orientation	Chi-square tests of independence will be used to analyze the differences in frequencies.  If significant differences in the frequencies exist, post hoc analysis using the standardized residual e will be used to determine the effects of individual cells.  For H <sub>2c</sub> , Cramer's coefficient will be computed to test the strength of the relationship between the variables.

3. What is the nature of the relationship between implicit theories and one's degree of goal specific self-efficacy?		
H <sub>3a</sub> : Participants with an incremental theory of intelligence will report higher levels of mastery approach goals than those who hold an entity theory.	Goal Specific Self-Efficacy Implicit Theories	A <i>t</i> test will be used to analyze the differences between the means
4. To what extent do student's achievement goals differ across the classes in which they are enrolled in a semester, and are these differences associated with congruent changes in their profile of goal specific self-efficacy?		
H <sub>4a</sub> : For those individuals who hold different goals for the classes in which they are enrolled, goal specific self efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self efficacy.	Goal Specific Self-Efficacy Achievement Goal Orientation	Chi-square tests of independence will be used to analyze the differences in frequencies.  If significant differences in the frequencies exist, post hoc analysis using the standardized residual <i>e</i> will be used to determine the effects of individual cells

### *Study 2 Research Design*

An experimental design was employed to address the fifth research question. Participants were randomly assigned to one of two conditions. In the first condition, the participants were exposed to a prime for an incremental theory of intelligence, while those in the other condition were exposed to a prime for an entity theory of intelligence. Dependent measures of goal specific self-efficacy and achievement goal orientation were subsequently taken from participants in both conditions. Differences on the dependent variables between these two conditions were analyzed using chi square tests of independence and *t* tests of independence.

### *Participants*

The participants were 71 undergraduate students enrolled in a local community college. Age was the only exclusionary criteria. Participants had to be least 18 years of age.

### *Independent Variable*

The participants were randomly assigned to receive either the questionnaire with the incremental prime or the questionnaire with the entity prime. The primes were positioned at the top of the questionnaire form. They were designed to appear to be a part of the explanation of the importance of the research. This was done with the intent of trying to make the primes seem like they are not out of place and as well as increasing the authority of their source. These primes were based off the primes used in past research described earlier in this paper (Curry et al, 2006; Hong et al, 1999)

.

*Entity Theory Prime:*

The purpose of this study is to investigate how college student's think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person has is, for the most part, a relatively fixed entity. While we can learn new things, we cannot change our innate intelligence. We know that in school some individuals will have an easier or more difficult time learning than will others based on this generally fixed level of ability preset in all of us. Given these disparities in individual's natural ability, it is important to help ensure that each student has the opportunity to reach their potential. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.

*Incremental Theory Prime:*

The purpose of this study is to investigate how college students think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person processes is, for the most part, changeable. That is, for most people, working hard and learning new things can actually increase how intelligent they are. We know that at school some individuals will work hard to learn new things and thereby increase their intelligence. However, others will not, and consequently they will fall behind in the development of their basic intelligence. Given the import role effort and motivation has in determining your present level of intelligence, it is important to help ensure that each student has the opportunity to

stay motivated. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.

### *Dependent Variables*

The same measures of goal specific self-efficacy and achievement goal orientation used in study 1 were obtained from participants in study 2.

### *Data Collection Procedures*

Data for both study 1 and study 2 were collected in the following manner. After receiving approval from the university, the researcher applied for and obtained institutional review board approval from the Human Investigation Committee (HIC). Data was collected from the students enrolled in classes at a local community college. The researcher contacted instructors to obtain permission to collect data in their classrooms. After permission was obtained, the researcher went into the classrooms and distributed the information sheets and the surveys. The information sheets were explained, along with the purpose of the study; assurances of confidentiality, what their role in the study would entail, the voluntary nature of participations, and the risk and benefits of their participation.

Those students who agreed to participate completed one of three different survey forms: form (a), form (b), or form (c). Form (a) was used to collect the data needed for study 1. It contained the measures of goal specific self-efficacy, achievement goal orientation, and implicit theories of intelligence. It also contained the item measuring the perceived relevancy of the course. Each student who received form (a) received two

additional copies of the goal specific self-efficacy scale and the goal orientation measure. They were instructed in the form's directions to complete these measures as they pertain to the other courses in which they were currently enrolled. Form (a) did not contain a prime for implicit theories.

Form (b) and form (c) were used to collect the data needed for study 2. Form (b) contained the prime for the entity theory of intelligence followed by the measures of goal specific self-efficacy and achievement goal orientation. Form (c) contained the prime for the incremental theory of intelligence followed by the measures of goal specific self-efficacy and achievement goal orientation. The students who received form (b) or (c) were not asked to complete additional measures for other classes in which they are enrolled.

Prior to their classroom distribution by the researcher, the three survey forms were arranged in random order. For all three forms, the order of the dependent measures, as well as the items within the measures, were counterbalanced by the researcher to reduce any order effects.

When completed, the researcher collected the survey forms. Upon returning the survey students were given the debriefing sheet. The completed surveys were kept under lock and key in the researcher's home office.

### *Data Analysis*

The data collected from the instruments was entered into a computer for analysis using Minitab Windows version 16. All decisions on the statistical significance of the findings were made using an alpha level of .05. Figure 2 presents the planned statistical analyses.

For  $H_{5b}$  a  $t$  test was used to analyze the differences between the mean of both conditions. For the rest of the hypotheses chi-square tests of independence were used to analyze the differences in frequencies.

## Figure 2

## Statistical Analysis

## Study 2

Research Questions/Hypothesis	Variables	Statistical Analysis
5. Can the effects of manipulations to one's theory of intelligence on goal orientation be explained by changes in the degree of ones self-efficacy for mastery approach goals?		
<p>H<sub>5a</sub>: Within the sample of those exposed to the manipulation of their implicit theory, goal specific self efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal in which the participant holds the highest degree of self efficacy.</p> <p>H<sub>5b</sub>: Individuals who are primed with an incremental theory of intelligence will report a higher degree of self-efficacy for mastery approach goals than individuals who were primed with an entity theory of intelligence.</p> <p>H<sub>5c</sub>: Participants primed with an entity theory of intelligence will report performance approach and performance avoidance goals at a higher frequency than those participants primed with an incremental theory of intelligence.</p> <p>H<sub>5d</sub>: Participants primed with an incremental theory of intelligence will report mastery approach and mastery avoidance goals at a higher frequency than those primed with an entity theory.</p> <p>H<sub>5e</sub>: Measures of goal specific self-efficacy will be a better predictor of achievement goal orientation than the implicit theory manipulation.</p>	<p><u>Independent Variable</u> Implicit Theory Priming</p> <p><u>Dependent Variable</u> Goal Specific Self Efficacy Achievement Goal Orientation</p>	<p>Chi-square tests of independence will be used to analyze the differences in frequencies for H<sub>5a</sub>, H<sub>5c</sub> H<sub>5d</sub>:</p> <p>If significant differences in the frequencies exist, post hoc analysis using the standardized residual e will be used to determine the effects of individual cells</p> <p>For H<sub>5b</sub> a t test will be used to analyze the differences between the mean of both conditions.</p> <p>For H<sub>5e</sub>, Cramer's coefficient will be computed to test the strength of the relationship between the variables.</p>

## Chapter IV

## Results of Data Analysis

Results of the data analyses that were used to address the research questions and test the hypotheses developed for this study are presented in this chapter. The chapter is divided into four sections. The first three sections will pertain to study 1, while the fourth section will address study 2. The first section uses cross tabulations, distributions, and descriptive statistics to provide a profile of the sample of study 1. The second section uses descriptive statistics to summarize the nature of the goal specific self-efficacy variables. Results of the inferential statistical analyses used to test the hypotheses are presented in the third section of the chapter.

*Study 1*

This study was designed to provide an understanding of the interconnection of the social cognitive social constructs involved in achievement motivation. Towards this aim, the construct of goal specific self-efficacy was measured in an attempt to understand the associations of achievement goal adoption through self-efficacy, as opposed to implicit theories, the link between which is not well supported by recent research.

Participants were recruited from a variety of classes across seven different disciplines of study at a suburban community college. All data was collected between the 3<sup>rd</sup> and 6<sup>th</sup> week of a 15 week winter semester. The data was collected directly by the principal investigator from individual classrooms, either at the start or at the end of the class period. Exact figures on the rate of participation could not be obtained, however the participation rate appeared to be about 90 percent. Table 1 contains the general descriptive statistics of the study.

Table 1

*Study 1 General Descriptive Statistics N=203*

	N	%		N	%
<u>Course</u>			<u>Goals</u>		
Math	52	25.6	Mastery Approach	72	35.4
Spanish	52	25.6	Performance Approach	77	37.9
English	22	10.8	Mastery Avoidance	29	14.3
Philosophy	17	8.4	Performance Avoidance	3	1.4
Geography	14	6.9	Not Reported	22	10.8
History	11	5.4			
Psychology	2	0.9	<u>Implicit Theories</u>		
Not Reported	33	16.3	Entity Theorist	53	26.1
			Incremental Theorist	115	56.7
<u>Gender</u>			Undecided	30	14.8
Males	72	35.5	Not Reported	5	2.5
Females	120	59.1			
Not Reported	11	5.4			
<u>Course Relevancy</u>					
Relevant	118	57.3			
Not Relevant	66	32.0			
Not Reported	22	10.7			

Overall 203 participants reported data in study one. Data were collected from participants enrolled in a variety of courses within seven general areas of study. The highest percentage of participants (25.6) came from math and spanish courses. Females outnumbered males at a rate of 1.7:1. Most students reported that the course was relevant to their major course of study (n = 118) while a minority (n = 66) reported that it was not.

Most students reported approach forms of motivation. Performance approach goals were reported the most frequently (37.9%), followed closely by mastery approach (35.4%), and then mastery avoidance goals (14.3%). Performance avoidance goals were reported very infrequently (1.4%). Because of their infrequency, they had to be excluded

as a group from several analyses.

In this sample, incremental theories of intelligence were reported at a much higher rate (56.7%) than entity theories (26.1%). The undecided category (14.8%) pertains to those participants whose scores fell in the middle of the “Theories of Intelligence Scale”, and could therefore not be categorized as either an incremental or an entity theorist.

Additional descriptive statistics by gender are presented in the following two tables. Table 2 presents goal adoption frequencies by gender. Table 3 presents implicit theory frequencies by gender.

Table 2

*Goal Adoption Frequencies by Gender*

Achievement Goals	<u>Gender</u>				<u>Totals</u>	
	<u>Males</u>		<u>Females</u>		N	%
	N	%	N	%		
Mastery Approach	27	41.5	43	39.4	70	40.2
Performance Approach	25	38.5	49	44.9	74	42.5
Mastery Avoidance	13	20.0	15	13.7	28	16.0
Performance Avoidance	0	0.0	2	1.8	2	1.2
Totals	65	100.0	109	100.0	174	100.0

Both genders appeared to be equally likely to hold each of the goals. The results of the chi-square test for independence used to determine if an association existed between participants’ gender and goal choice was not statistically significant  $\chi^2(2) = 1.399, p = .494$ .

Table 3

*Implicit Theory Frequencies by Gender*

Implicit Theory	<u>Gender</u>					
	<u>Males</u>		<u>Females</u>		<u>Totals</u>	
	N	%	N	%	N	%
Entity Theorist	17	24.3	33	27.5	50	24.8
Incremental Theorist	45	64.3	68	56.7	113	55.9
Undecided	10	14.3	19	15.8	29	19.3
Totals	72	100.0	120	100.0	192	100.0

Both genders appeared to be equally likely to hold each implicit theory. The results of the chi-square test for independence used to determine if an association existed between participants' gender and implicit theory was not statistically significant  $\chi^2(2) = 0.796, p = .672$ .

*Goal Specific Self-Efficacy*

Goal specific self-efficacy was measured for each of the goals in the 2x2 achievement goal framework: self-efficacy for mastery approach goals, self-efficacy for performance approach goals, self-efficacy for mastery avoidance goals, and self-efficacy for performance avoidance goals. The items for the goal specific self-efficacy scales were modified from the Achievement Goal Questionnaire, a frequently employed measure of goal orientation in the 2x2 framework (Elliot & McGregor, 2001). The modification consisted of altering the items to make them read as self-efficacy items instead of goal items, and making the items course specific. For example, the original item, "it is important to me to do better than other students" was transformed into, "I am

confident that I could do better than most other students in this class.” The subjects responded to each item on a scale of 0 to 100, indicating their degree of agreement with the statements as far as they pertain to a particular course in which they are currently enrolled. Three self-efficacy items were formed this way for each of the four goals. The participant’s self-efficacy scores presented below are an average of these three items. For each domain of self-efficacy the possible range of scores was 0 to 100.

Descriptive statistics regarding these measures are presented in the following two tables. Table 4 presents goal specific self-efficacy means and standard deviations by gender, and Table 5 presents the goal specific self-efficacy means and standard deviations by course relevancy. Lastly, Table 6 presents intercorrelations of the different domains of goal specific self-efficacy.

Table 4

*Goal Specific Self-Efficacy Means and Standard Deviations by Gender*

Self Efficacy	<u>Gender</u>			
	<u>Male (n = 70)</u>		<u>Female (n = 120)</u>	
	M	SD	M	SD
Mastery Approach	73.9	17.7	74.4	18.7
Performance Approach	75.3**	19.7	65.6	22.4
Mastery Avoidance	62.1	22.4	64.4	26.4
Performance Avoidance	76.1	20.9	75.5	21.9

\*\* p<.01

The means and standard deviations for each of the four domains of self-efficacy were compared by gender. The results of these analyses are presented in Table 4. Male

participants reported a higher level of self-efficacy for performance approach goals than did the female participants ( $t = 3.07$ ,  $p = 0.003$ ,  $d = .460$ ). Both genders reported statistically equivalent levels of self-efficacy for mastery approach, mastery avoidance, and performance avoidance goals.

Table 5

*Goal Specific Self-Efficacy Means and Standard Deviations by Relevancy*

	<u>Course Relevancy</u>			
	<u>Relevant (n = 114)</u>		<u>Not Relevant (n = 65)</u>	
Self Efficacy	M	SD	M	SD
Mastery Approach	76.9*	16.7	68.9	22.2
Performance Approach	71.1*	21.1	63.0	23.8
Mastery Avoidance	65.1	24.6	61.8	27.9
Performance Avoidance	76.0	20.8	75.4	22.6

\*  $p < .05$

Higher levels of self-efficacy for mastery approach ( $t = 2.55$ ,  $p = 0.012$ ,  $d = .356$ ) and performance approach goals ( $t = 2.26$ ,  $p = 0.025$ ,  $d = .412$ ) were found among participants indicating that their course was relevant to their major course of study, as compared to those reporting that their course was not relevant. No significant differences in self-efficacy for avoidance goals were found between these groups. Therefore, it appears that reported course relevancy was associated with higher levels of self-efficacy for approach, but not avoidance goals.

Table 6

*Correlations of Domains of Goal Specific Self-Efficacy by Gender and Relevancy*

Self-Efficacy	<u>Self-Efficacy</u>		
	Mastery Approach	Performance Approach	Mastery Avoidance.
Performance Approach.			
Males	.59		
Females	.69		
Relevant	.55		
Not Relevant	.75		
Overall	.66		
Mastery Avoidance.			
Males	.61	.28	
Females	.68	.68	
Relevant	.61	.39	
Not Relevant	.72	.56	
Overall	.63	.43	
Performance Avoidance.			
Males	.37	.32	.61
Females	.51	.54	.62
Relevant	.51	.49	.54
Not Relevant	.50	.48	.72
Overall	.46	.45	.61

all correlations are significant  $p < .05$

Pearson product moment correlations were completed between the four domains of goal specific self-efficacy measured in this study. Table 6 presents the full correlation matrix. The highest overall correlation was found between self-efficacy for mastery approach and performance approach goals ( $r = .66$ ). The lowest overall correlation was found between self efficacy for performance approach and mastery avoidance goals ( $r = .43$ ).

The participants were asked to complete the goal specific self-efficacy items for up to three courses in which they were currently enrolled. The correlations of their self efficacy scores across two courses are presented in Table 7.

Table 7

*Within Subject Correlations of Goal Specific Self-Efficacy Across Courses in Which They Are Currently Enrolled*

Self Efficacy	Goal Consistency Across Courses (n =131)		
	Same Goals	Different Goals	Total
Mastery Approach	.48	.10(ns)	.29
Performance Approach	.59	.32	.47
Mastery Avoidance	.50	.29	.40
Performance Avoidance	.60	.35	.48

ns: non significant

Of the participants, 131 reported data for more than one course. Pearson product moment correlations were obtained for within person differences in self-efficacy over two courses. All correlations were statistically significant ( $p < .05$ ), unless otherwise indicated. Correlations within each domain of self-efficacy were higher when the participant had chosen the same goal for both courses than when different goals were chosen. The largest difference in correlation was observed for self-efficacy for mastery approach goals. This domain demonstrated a moderate degree of between class stability ( $r = .48$ ) when the goals for the classes being compared were the same. When the goals for the classes were not the same, the correlation dropped to a level indicating statistical independence ( $r = .10$ ).

### *Research Questions and Hypotheses*

*Research Question 1.* Can goal specific self-efficacy be used to predict achievement goal adoption?

H<sub>1a</sub>: Goal specific self-efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self-efficacy.

Participants were placed into four categories based on their highest level of goal specific self-efficacy. For the avoidance goals the valence was reversed, where a high score indicates a low level of self-efficacy to avoid a poor mastery or performance outcome. The frequency of goal adoption for the participants in each of these categories is presented in Table 8.

Table 8

#### *Cross tabulations-Goals by Highest Degree of Self-Efficacy*

Goals	<u>Groups by Highest Degree of Self-Efficacy</u>							
	<u>Mastery Approach</u>		<u>Performance Approach</u>		<u>Mastery Avoidance</u>		<u>Totals</u>	
	N	%	N	%	N	%	N	%
Mastery Approach	36	46.8	15	31.9	6	31.6	57	40.0
Performance Approach	25	32.5	24	51.1	11	57.9	60	42.0
Mastery Avoidance	16	20.8	8	17.0	2	10.5	26	18.2
Totals	77	100.0	47	100.0	19	100.0	143	100.0

The majority of participants were found to have their highest level of self-efficacy be for mastery approach goals (n = 77), followed by performance approach (n = 47), and

then mastery avoidance goals (n = 19). Only three participants fell into the performance avoidance category, therefore this group was excluded from the analysis.

The results of the chi-square test for independence used to determine if an association existed between participants' highest level of goal specific self-efficacy and achievement goal adoption was not statistically significant  $\chi^2(4) = 6.654, p = .150$ .

Further analysis was performed to determine if goals could be predicted by highest level of self-efficacy if the analysis focused only on the approach component of each goal. The results of this analysis are presented in Table 9.

Table 9

*Cross tabulations-Goals by Highest Degree of Self-Efficacy –Approach Goals Only*

Goals	<u>Groups by Highest Degree of Self-Efficacy</u>					
	<u>Mastery Approach</u>		<u>Performance Approach</u>		<u>Totals</u>	
	N	%	N	%	N	%
Mastery Approach	36	59.0	15	38.5	51	51.0
Performance Approach	25	41.0	24	61.5	49	49.0
Totals	61	100.0	39	100.0	100	100.0

The results of the chi-square test for independence used to determine if an association existed between participants' highest level of goal specific self-efficacy (approach only) and achievement goal adoption (approach only) was statistically significant  $\chi^2(1) = 4.05, p = 0.044$ . Participants whose highest degree of goal specific self-efficacy was for mastery approach goals selected mastery approach goals at a higher frequency than they did performance approach goals. Participants whose highest degree of goal specific self-efficacy was found for performance approach goals selected

performance goals at a higher frequency than they did mastery approach goals. Overall the preceding Chi Squares only provided partial support for hypothesis H<sub>1a</sub>, which stated that the highest relative level of self-efficacy would predict goal adoption for all the domains, not just the approach domain. Alternative analyses were employed to answer research question 1, which asks if measures of goals specific self-efficacy could predict achievement goal adoption. Those analyses are presented in Table 10 and Table 11.

Table 10

*t-Tests Comparing Mean Goal Specific Self-Efficacy Scores by Goal Adoption*

	Goals					
	Mastery Approach (n=70)		Performance Approach (n=77)		Mastery Avoidance (n=27)	
Self Efficacy	M	SD	M	SD	M	SD
Mastery Approach	79.8***	16.1	67.8	19.8	77.3**	14.3
Performance Approach	71.5	23.5	65.4	21.7	72.1	17.3
Mastery Avoidance	70.0*	23.5	56.4	25.3	67.6*	22.8
Performance Avoidance	79.5	21.9	72.9	22.4	74.5	18.7

\*\*\* p<.001, \*\* p<.01, \* p<.05

Compared to those adopting performance approach goals, participants who adopted mastery approach goals had a higher level of self-efficacy for mastery approach ( $t = 4.05$ ,  $p < 0.001$ ,  $d = .67$ ) and mastery avoidance goals ( $t = 3.00$ ,  $p = 0.003$ ,  $d = .55$ ). Differences between these two groups were not found in their levels of self-efficacy for performance approach ( $t = 1.64$ ,  $p = 0.104$ ) or performance avoidance goals ( $t = 1.64$ ,  $p = 0.104$ ).

Participants who adopted mastery avoidance goals were statistically equivalent to

those who adopted mastery approach goals on all four domains of goal specific self efficacy. Relative to those adopting performance approach goals, they showed the same pattern of differences in goal specific self-efficacy as did the group who adopted mastery approach goals; with higher levels of self efficacy for mastery approach ( $t = 2.67, p = 0.010, d = .56$ ) and mastery avoidance goals ( $t = 2.12, p = 0.039, d = .465$ ), and statistically undifferentiated levels of self efficacy for performance approach ( $t = 1.63, p = 0.108$ ) and performance avoidance goals ( $t = 0.37, p = 0.713$ )

In addition to the inter goal differences stated above, some intra goal differences in the pattern of self-efficacy were found. Those adopting mastery approach goals had a higher level of self efficacy for mastery approach goals than they did for performance approach goals ( $t = 2.43, p = 0.017, d = .412$ ). In contrast, those adopting performance approach goals had statistically undifferentiated levels of self-efficacy for mastery approach and performance approach goals ( $t = 0.72, p = 0.475$ )

Since it appeared that participant's levels of self-efficacy for mastery goals, as opposed to performance goals, were related to goal adoption, further analysis was performed to elaborate on the findings presented in Table 10. Those findings are presented in Table 11.

Table 11

*Goal Adoption Rates by Median Split of Self Efficacy for Mastery Approach Goals*

	Self-Efficacy for Mastery Approach					
	<u>Top Half</u>		<u>Bottom Half</u>		<u>Total</u>	
	N	%	N	%	N	%
Achievement Goals						
Mastery Goals	60	69.8	37	40.7	97	54.8
Performance Goals	26	30.2	54	59.3	80	45.2
Totals	86	100.0	91	100.0	177	100.0

A median split was performed on the participant's self-efficacy for mastery approach goals, resulting in the formation of two groups: those in the top half of self efficacy for mastery approach goals and those in the bottom half. The frequency of goal adoption for each of these two groups was then obtained. The approach and avoidance components of each orientation were combined. The chi square analysis employed to test the differences in the frequencies was found to be significant  $\chi^2(1)=15.375$ ,  $p < 0.001$ . Those in the top half of self-efficacy for mastery approach goals were more than twice as likely to adopt mastery goals as opposed to performance goals, while those in the bottom half of the split adopted performance goals at a rate of nearly one and a half times greater than they did mastery goals.

These findings address the first research question, "Can goal specific self-efficacy be used to predict achievement goal adoption?". It appears that goal specific self-efficacy can be used to predict goal adoption. However, this relationship appears generally be limited to the participant's level of self-efficacy for mastery approach goals, instead of all four domains as was hypothesized.

*Research Question 2* Are implicit theories related to achievement goal adoption, and what is the degree of that relationship relative to the construct of goal specific self-efficacy?

- H<sub>2a</sub>: Implicit theories will not be independent of achievement goal adoption. Specifically, participants with an entity theory of intelligence will endorse performance approach and performance avoidance goals at a higher frequency than they will endorse mastery approach or mastery avoidance goals.
- H<sub>2b</sub>: Implicit theories will not be independent of achievement goal adoption. Specifically, individuals with an incremental theory of intelligence will endorse mastery approach and mastery avoidance goals at a higher frequency than they will endorse performance approach or performance avoidance goals.
- H<sub>2c</sub>: Goal specific self-efficacy will be a better predictor of achievement goal orientation than implicit theories.

Participants were divided into two groups (Entity Theorist, Incremental Theorist) based on their responses to the “Theories of Intelligence Scale”. The frequency by which each of these groups adopted either a performance or a mastery goal was calculated. The results of this analysis are presented in Table 12.

Table 12

*Cross tabulation of Goals by Implicit Theories*

Goals	<u>Implicit Theory</u>					
	<u>Incremental Theorists</u>		<u>Entity Theorists</u>		<u>Totals</u>	
	N	%	N	%	N	%
Mastery Goal (approach + avoidance)	60	58.3	26	55.3	86	57.3
Performance Goals. (approach + avoidance)	43	41.7	21	44.7	64	42.7
Total	103	100.0	47	100.0	150	100.0

The results of the chi-square test for independence used to determine if an association existed between participants' implicit theory and goal adoption was not statistically significant  $\chi^2(1) = 0.223, p = .637$ . Therefore it appears that implicit theories were not associated with achievement goal adoption. This finding does not support hypotheses H<sub>2a</sub> or H<sub>2b</sub>. However, this finding supports hypothesis H<sub>2c</sub> in that, since implicit theories were not predictive of goal adoption, the findings previously presented on the relationship between self-efficacy and goals shows that goal specific self-efficacy was a better predictor.

*Research Question 3.* What is the nature of the relationship between implicit theories and one's degree of goal specific self-efficacy?

H<sub>3a</sub>: Participants with an incremental theory of intelligence will report higher levels of self-efficacy for mastery approach goals than those who hold an entity theory.

Participants were divided into two groups (Entity Theorist, Incremental Theorist) based on their responses to the "Theories of Intelligence Scale". The levels of goal specific self-efficacy across these groups were analyzed. The results of this analysis are presented in Table 13.

Table 13

*t-Tests of Goal Specific Self-Efficacy Means by Implicit Theory*

Self Efficacy	<u>Implicit Theory</u>			
	<u>Incremental (n=112)</u>		<u>Entity (n=51)</u>	
	M	SD	M	SD
Mastery Approach	74.3*	18.9	69.4	21.3
Performance Approach	69.0	22.2	66.2	23.9
Mastery Avoidance	63.0*	25.9	56.8	28.5
Performance Avoidance	75.5	21.5	72.1	23.2

\*p &lt; .05

Consistent with the hypotheses, higher levels of self-efficacy for mastery approach goals were found among those holding an incremental theory of intelligence as compared to an entity theory ( $t = 2.23$ ,  $p = 0.014$ ,  $d = .243$ ). Higher levels of self efficacy for mastery avoidance goals were found among those holding an incremental theory of intelligence as compared to an entity theory ( $t = 2.19$ ,  $p = 0.031$ ,  $d = .228$ ). Differences in levels of self-efficacy for performance goals were not found between entity and incremental theorists. These results support hypothesis H<sub>3a</sub>. Participants with an incremental theory of intelligence did report higher levels of mastery goal self-efficacy than those who held an entity theory.

*Research Question 4.* To what extent do student's achievement goals differ across the classes in which they are enrolled in a semester, and are these differences associated with congruent changes in their profile of goal specific self-efficacy?

H<sub>4a</sub>: For those individuals who hold different goals for the classes in which they are enrolled, goal specific self-efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self

efficacy.

To address this research question, analysis of goal stability across courses was conducted. These results are presented in Table 14. The degree to which these changes in goal adoption from course to course were associated with congruent changes in self-efficacy is presented in Table 15 and Table 16.

Table 14

*Goal Stability Rates Across Courses*

# of Courses	<u>Goal Consistency across Courses</u>			
	<u>Two Courses</u>		<u>Three Courses</u>	
	N	%	N	%
Same Goals	83	63.4	35	60.3
Different Goals	48	36.6	23	39.7
Total	131	100.0	58	100.0

The rate of within subject consistency of goal adoption among the four goals was measured over the span of two and three courses. Of the participants, 131 reported goals for at least two classes, and 58 reported goals for three classes. Over the span of two classes, 63 percent of participants reported the same goal while 36 percent reported a different goal. Of those participants reporting data on a third classes, the same goal (out of the four possible choices) was chosen for all three classes 60 percent of the time.

Table 15

*t-Tests of Within Subject Differences in Goal Specific Self-Efficacy From Participants Who Reported Mastery Goals for Their Current Class and Performance Goals for an Additional Class (n=29)*

Self Efficacy	Current Class Mastery Goals (Approach + Avoidance)		Additional Class Performance Goals (Approach + Avoidance)	
	M	SD	M	SD
Mastery Approach	79.4*	18.7	68.3	24.4
Performance Approach	69.4	22.1	67.2	25.5
Mastery Avoidance	68.7	25.4	67.7	23.7
Performance Avoidance	73.7	22.4	71.7	24.5

\*p<.05

Measurements of achievement goals and self-efficacy were taken from participants in regards to up to three courses in which they were currently enrolled. The above table summarizes the differences in self-efficacy across courses from participants who reported mastery goals in their first class and performance goals for an additional class. Participant's level of self-efficacy for mastery approach goals was found to be significantly lower for the additional class in which performance goals were adopted as compared to the class for which mastery goals were adopted ( $t = 2.13$ ,  $p = 0.037$ ,  $d = .511$ ). This difference in self-efficacy was not found in the domains of self efficacy for performance approach goals ( $t = 0.39$ ,  $p = 0.696$ ), self-efficacy for mastery avoidance goals ( $t = 1.36$ ,  $p = 0.180$ ), or self-efficacy for performance avoidance goals ( $t = 0.32$ ,  $p = 0.750$ ).

Table 16

*t-Tests of Within Subject Differences in Goal Specific Self-Efficacy From Participants Who Reported Performance Goals for Their Current Class and Mastery Goals for an Additional Class (n=32)*

	Current Class Performance Goals (Approach + Avoidance)		Additional Class Mastery Goals (Approach + Avoidance)	
	M	SD	M	SD
Self Efficacy				
Mastery Approach	63.6	18.9	70.4	20.2
Performance Approach	60.4	22.7	67.4	20.6
Mastery Avoidance	53.5	24.7	67.7*	23.7
Performance Avoidance	70.3	23.8	71.7	24.5

\*p<.05

Measurements of goals and self-efficacy were taken from participants in regards to up to three courses in which they were currently enrolled. The above table summarizes the difference in self-efficacy among participants who reported performance goals for their current class and mastery goals for an additional class. Levels of self-efficacy for mastery avoidance goals were found to be higher for this additional class in which mastery goals were reported ( $t = 2.47$ ,  $p = 0.016$ ,  $d = .587$ ). This difference in self-efficacy was not found in the domains of self-efficacy for mastery approach goals ( $t = 1.45$ ,  $p = 0.151$ ), self-efficacy for performance approach goals ( $t = 1.34$ ,  $p = 0.185$ ), or self-efficacy for performance avoidance goals ( $t = 0.29$ ,  $p = 0.775$ ).

The data presented in Table 14 provided evidence that goals showed a moderate degree of variability among the classes the participants were enrolled in for the semester. Data presented in Table 15 and Table 16 provided evidence that when goals change they are associated with changes in goal specific self-efficacy. These findings are partially supportive of Hypotheses H<sub>4a</sub>. Changes in goal adoption were associated with congruent

changes in self-efficacy, however, as stated earlier, the nature of that association differed from what was originally hypothesized.

### *Study 2*

The purpose of study 2 was to attempt to prime changes in the participant's implicit theories of intelligence. Consistent with prior research it was thought that those experimental changes would result in differences in reported goal adoption. The aim of doing this for the current study was to determine if these changes in goal adoption by implicit theory manipulation could be explained by changes in self-efficacy for mastery goals. For the manipulation 35 participants received the entity theory prime and 36 received the incremental theory prime. Due to a concern about a "testing" threat to internal validity, a manipulation check was not performed to determine if the implicit theory primes had in fact produced changes in the participant's implicit theories. The general descriptive statistics for the study are presented in Table 17.

Table 17

#### *General Demographics for Study 2*

Courses	N	%	Goals	N	%
Math	21	29.6	Mastery Approach	27	44.6
Psychology	21	29.6	Performance Approach	18	29.5
English	11	15.5	Mastery Avoidance	12	19.7
History	17	23.9	Performance Avoidance	4	6.6
Not Reported	1	1.4	Not Reported	10	16.4
Totals	71	100.0	Totals	71	100.0

Overall 71 participants reported data for study 2. Data was collected from participants from a variety of courses from four departments: math (n =21), psychology, (n = 21), history (n =17), and English (n =11). The majority of the participants reported mastery approach goals (n= 27) followed by performance approach (n =18), mastery avoidance (n =12) and performance avoidance (n =4). The data was collected in the same manner as was for study 1.

*Research Question 5.* Can the effects of manipulations to one's theory of intelligence on goal orientation be explained by changes in the degree of ones self-efficacy for mastery approach goals?

H<sub>5a</sub>: Within the sample of those exposed to the manipulation of their implicit theory, goal specific self-efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal in which the participant holds the highest degree of self-efficacy.

H<sub>5b</sub>: Individuals who are primed with an incremental theory of intelligence will report a higher degree of self-efficacy for mastery approach goals than individuals who were primed with an entity theory of intelligence.

H<sub>5c</sub>: Participants primed with an entity theory of intelligence will report performance approach and performance avoidance goals at a higher frequency than those participants primed with an incremental theory of intelligence.

H<sub>5d</sub>: Participants primed with an incremental theory of intelligence will report mastery approach and mastery avoidance goals at a higher frequency than those primed with an entity theory.

H<sub>5e</sub>: Measures of goal specific self-efficacy will be a better predictor of achievement goal orientation than the implicit theory manipulation.

In order to test hypotheses H<sub>5c</sub> and H<sub>5d</sub>, a chi square test of independence was conducted to examine whether the implicit theory prime had an effect on the frequencies of achievement goal orientation. The results of this analysis are presented in Table 18.

Table 18

*Cross tabulation of Goals by Implicit Theory Prime*

Goals	<u>Implicit Theory Prime</u>					
	<u>Entity</u>		<u>Incremental</u>		<u>Total</u>	
	N	%	N	%	N	%
Mastery (approach + avoidance)	19	65.5	20	62.5	39	63.3
Performance (approach + avoidance)	10	34.5	12	37.5	22	36.7
Total	29	100.0	32	100.0	61	100.0

The results of the chi-square test for independence used to determine if an association existed between the implicit theory prime and goal adoption was not statistically significant  $\chi^2(1)=.115, p=.734$ . The implicit theory manipulation appeared to have no effect on goal adoption. These results failed to support hypotheses H<sub>5c</sub> and H<sub>5d</sub>.

In order to test hypothesis H<sub>5a</sub>, t tests were conducted to examine the differences in self-efficacy between the group primed with an entity theory and the group primed with an incremental theory. The results of this analysis are presented in Table 19.

Table 19

*t-Tests Measuring the Effects of Implicit Theory Priming on Goal Specific Self-Efficacy*

Implicit Theory Prime	<u>Self-Efficacy</u>							
	Mastery Approach		Performance Approach		Mastery Avoidance		Performance Avoidance	
	M	SD	M	SD	M	SD	M	SD
Entity (n=35)	78.1	17.9	72.3	22.4	67.6	22.4	73.8	24.0
Incremental (n=36)	79.7	19.5	70.0	22.1	73.6	24.0	81.6	22.7

Contrary to hypothesis H<sub>5b</sub>, receiving the incremental theory prime did not increase participant's self-efficacy for mastery approach goals ( $t = -0.37$ ,  $p = 0.713$ ). No other significant effects on self-efficacy were found for the implicit theory primes.

A chi square test of independence was used to test hypothesis H<sub>5a</sub>. The results of this analysis are presented in Table 20.

Table 20

*Cross tabulations-Goals by Highest Degree of Self-Efficacy*

Goals	<u>Groups by Highest Degree of Self-Efficacy</u>							
	Mastery Approach		Performance Approach		Mastery Avoidance		Totals	
	N	%	N	%	N	%	N	%
Mastery Approach	12	60.0	3	23.1	6	60.0	21	48.8
Performance Approach	6	30.0	7	53.8	2	20.0	15	34.9
Mastery Avoidance	2	10.0	3	23.1	2	20.0	7	16.3
Totals	20	100.0	13	100.0	10	100.0	43	100.0

The results of the chi-square test for independence used to determine if an association existed between participants' highest level of goal specific self-efficacy and achievement goal adoption was not statistically significant  $\chi^2(4) = 5.923$ ,  $p = .205$ . These findings fail to support hypothesis H<sub>5a</sub>. As in the first study, it appears that grouping participants by highest degree of goal specific self-efficacy does not result in the hypothesized pattern of association with achievement goals. Similar to the analysis employed in the first study, mean testing was completed to understand the connection between self-efficacy and goals. The results of these analyses are presented in Table 21.

Table 21

*t-Tests Comparing Mean Goal Specific Self-Efficacy Scores by Goal Adoption*

Self Efficacy	Goal Adoption					
	Mastery Approach (n=26)		Performance Approach (n=18)		Mastery Avoidance (n=12)	
	M	SD	M	SD	M	SD
Mastery Approach	85.3**	11.0	68.7	18.3	86.0	18.3
Performance Approach	78.6	19.3	64.8	17.8	72.4	17.8
Mastery Avoidance	70.0	24.2	63.9	24.6	78.8	24.6
Performance Avoidance	82.3	19.6	71.9	28.2	78.5	28.2

\*\*  $p < .01$

Compared to those adopting performance approach goals, individuals who adopted mastery approach goals had a higher level of self-efficacy for mastery approach goals ( $t = 2.85$ ,  $p = 0.009$ ,  $d = 1.11$ ). Differences between these two groups were not found in their levels of self-efficacy for performance approach ( $t = 1.84$ ,  $p = 0.077$ ), mastery avoidance ( $t = 0.88$ ,  $p = 0.385$ ), or performance avoidance goals ( $t = 1.40$ ,  $p = 0.173$ ).

Participants who adopted mastery avoidance goals were statistically equivalent to those who adopted mastery approach goals on all four domains of goal specific self efficacy. However a comparison on their levels of self-efficacy for mastery approach goals to those adopting performance goals did not result in a significant finding ( $t = 2.05$ ,  $p = 0.051$ ).

## Chapter V

## Summary, Discussion of Study 1, Discussion of Study 2, Limitations, Implications for Future Research

*Summary*

The goal of this study was to examine the interconnection of the major social cognitive constructs involved in achievement motivation: self-efficacy, implicit theories of intelligence, and achievement goals. Much research has been conducted examining the relationship between achievement goals and implicit theories. The most prevalent theoretical model cited in the literature (Dweck & Legget, 1988) suggests that achievement goals are the result of implicit theories, where entity theorists tend to adopt performance goals and incremental theorists tend to adopt mastery goals. However, although often cited, this contention has received little empirical support (e.g., Elliot & McGregor, 2001; Howell & Burro, 2009). In regards to the relationship between achievement goals and self efficacy, self efficacy measured for a particular discipline of study, or academics in general, tends to be positively correlated with both mastery goals and performance goals (e.g., Bandalos et al. 2003; Heish, 2008; Long et al, 2007). These findings have not resulted in an understanding of how these constructs are dynamically related. Lastly, very little research has been conducted to understand the possible interconnections between implicit theories and self-efficacy, or between all three of these constructs within a single sample.

In order to progress from previous research examining the integration of these constructs, two changes were made to the common methodology. First, achievement goals were measured in an “either or” fashion. Each of the four goals of the 2x2 framework were pitted against each other, where the participants were asked to pick the

goal that most accurately reflected their aims for each of their courses. Secondly, self efficacy in this study was not measured for the discipline of study (i.e. self-efficacy for mathematics) or for academics in general. Instead, self-efficacy was measured for each of the achievement goals in the 2x2 framework (e.g., self efficacy for performance approach goals). The aim of doing so was to conceptualize self-efficacy in a manner that could be more readily integrated with both achievement goals and implicit theories.

Therefore, the purpose of the current study was to explore the validity of the concept of goal specific self-efficacy and to measure its covariation with achievement goals relative to that of implicit theories of intelligence. In doing so, it was hoped that progress could be made towards a better understanding of the interconnection of these three social cognitive constructs so prevalent in the literature.

#### *Discussion for Study 1*

A total of 203 students participated in study 1. All of these participants were recruited from their classrooms at a large suburban community college. Data was collected from a variety of classes within seven different disciplines of study between the 3<sup>rd</sup> and 6<sup>th</sup> week of a 15 week winter semester. The data was collected directly by the principal investigator from individual classrooms, either at the start or at the end of the class period. Measures of goal specific self efficacy, achievement goals, and implicit theories were taken from each participant for up to three courses in which they were currently enrolled. Self reported measures of gender and course relevancy were also obtained.

### *Implicit Theories and Goals*

Despite a paucity of empirical support, the contention that achievement goals stem from implicit theories continues to be widely cited in the literature (e.g., Aronson et al, 2002; Blackwell et al, 2007; Bong, 2008; Cury et al, 2006; Durik et al, 2009). Early research has found an association between implicit theories and goals, where individuals with an entity theory of intelligence were found to prefer performance goals while individuals with an incremental theory of intelligence tended to adopt mastery goals (Dweck & Legget, 1988). However, most recent research has found that this relationship does not hold to a consistent and meaningful degree (e.g., Elliot & McGregor, 2001; Howell & Buro, 2009). The current study sought to test this relationship. The hypotheses are restated below:

- H<sub>2a</sub>: Implicit theories will not be independent of achievement goal adoption. Specifically, participants with an entity theory of intelligence will endorse performance approach and performance avoidance goals at a higher frequency than they will endorse mastery approach or mastery avoidance goals.
- H<sub>2b</sub>: Implicit theories will not be independent of achievement goal adoption. Specifically, individuals with an incremental theory of intelligence will endorse mastery approach and mastery avoidance goals at a higher frequency than they will endorse performance approach or performance avoidance goals.

Similar to recent attempts to replicate the earlier findings, the current study did not find the hypothesized link between implicit theories and goal adoption. Entity theorists and incremental theorists were found to have adopted mastery and performance goals at a statistically equivalent rate.

This finding is especially damaging to the idea that goals stem from implicit theories, in that, unlike the other recent studies that failed to find the hypothesized relationship, the current study pitted the goals against each other. This methodology

was more similar to the design of the original studies supporting the hypothesis. Therefore these results, along with the results of most studies that have examined this relationship over the past decade, call into question the generalizability of the early findings and the contention that goals are directly related to implicit theories in any significant way.

### *Goal Specific Self-Efficacy*

Previous research investigating the connection between goals and self-efficacy has generally resulted in positive correlations between self-efficacy and both mastery and performance goals (Bandalos et al. 2003; Heish, 2008; Long et al, 2007). Other research has found positive correlations between self efficacy and mastery goals, but not between self efficacy and performance goals (Button et al, 1996; Phillips & Gully, 1997). In all of these studies self-efficacy was measured for either the discipline of study or for academics in general. In contrast, the current study sought to clarify these relationships by measuring self efficacy for each of the achievement goals in the 2 x 2 goal framework. In doing so we hoped to better understand the relationship between the self efficacy and achievement goals, as well as the relationship between self-efficacy and implicit theories.

Moderate correlations were found between participant's levels of self-efficacy for each of the goals in the 2x2 framework. This finding provides evidence that that they exist as separate, albeit related, domains of personal efficacy. For the total sample, intercorrelations between the four domains of self-efficacy ranged from .43 to .66. While these intercorrelations are substantial, they are not necessarily suggestive of a unitary construct. Gender differences were found within the domains of self-efficacy. Males tended to report higher levels of performance approach self efficacy than did the

female participants. No gender differences were found in the other domains of self-efficacy. Also, males tended to have lower correlations between the domains of self-efficacy than did the female participants, suggesting that they may hold efficacy beliefs that are more independent of each other. This is especially true when considering the correlations of male's self-efficacy for performance approach goals and their self-efficacy for both mastery avoidance ( $r = .32$ ) and performance avoidance goals ( $r = .28$ ).

Participant's levels of goal specific self-efficacy were also found to vary by course relevancy. For the courses that were reported to be relevant to the participant's major course of study, levels of self-efficacy for both mastery approach and performance approach goals were found to be higher than they were for courses that were not reported to be relevant. Levels of self-efficacy for both mastery avoidance goals and performance avoidance goals did not vary by course relevancy.

Participant's levels of self-efficacy for each of the domains were compared across the courses in which they were currently enrolled. Overall, low to moderate levels of within subject consistency in self-efficacy were found for the domains. Interestingly, this consistency of self-efficacy across courses appears to be related to goal adoption. When participants reported the same goal for two classes, within subject correlations across these classes were significant for each of the four domains of self-efficacy. However, in cases where the goals were different, these correlations were found to be significant for each domain except for the domain of mastery approach self-efficacy. In other words, participant's level of mastery approach self-efficacy appears to be the most contextually dependent of the four domains. Moreover, this context dependence of mastery approach self-efficacy appears to depend on the goals individuals adopt.

Participants showed no consistency in mastery approach self efficacy across courses unless the goals for the courses were the same. This finding suggests that a different underlying processes, related to goals, may be at work for mastery approach self efficacy than are for the other three domains.

### *Goals & Self-Efficacy*

Given the lack of empirical support for the link between implicit theories and achievement goals, the current study attempted to test the hypothesis that goal adoption could be understood through self efficacy theory, provided that self efficacy was measured for individual achievement goals, rather than the course in general. It was originally hypothesized in this study that the domain in which the participant held the highest degree of goal specific self efficacy would most likely be the domain of their goal choice.

H<sub>1a</sub>: Goal specific self-efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal for which the participant holds the highest degree of self-efficacy

In other words, individuals whose highest level of self-efficacy was for mastery approach goals would tend to adopt mastery approach goals, and so on so forth for each of the goals in the 2x2 framework. That exact hypothesis, however, failed to be supported by the present study. It appeared that the hypothesis was not supported due to the relationship between self-efficacy and the avoidance goals, which failed to follow in the expected pattern. However, it was found that when just the two approach goals were analyzed, the highest degree of self-efficacy was significantly related to goal adoption. In this context, participants whose highest degree of self efficacy was for mastery approach goals selected mastery approach goals at a higher frequency than they did

performance approach goals. Additionally, participants whose highest degree self-efficacy was for performance approach goals selected performance approach goals at a higher frequency than they did mastery approach goals.

Although (with the elimination of the avoidance goals) the hypothesis was partially supported, it appears that trying to make a connection between the goal with the highest level of self-efficacy and goal choice is not the best approach. However, that is not to say that meaningful relationships between achievement goals and goal specific self efficacy were not found, only that the relationship appears to be of a different nature than what was specifically hypothesized. Further analysis was conducted, and a clear connection between achievement goals and self-efficacy was found. Goal adoption appears to be associated with the participant's mastery approach self efficacy, where participants who endorsed mastery goals had a higher level of self-efficacy for mastery goals than those endorsing performance goals. In contrast, participant's level of self efficacy for performance approach goals and for avoidance goals of both type, appear to have little relationship, by comparison, to goal adoption.

Using a median split, we found that individuals with high mastery approach self efficacy chose mastery approach goals at a rate of more than two to one over performance goals, while individuals with a low mastery approach self-efficacy chose performance goals at a rate of nearly one and a half times that of mastery goals. Therefore, it appears that the choice between mastery and performance goals can be predicted by self-efficacy for mastery goals. When self-efficacy for mastery goals is high, mastery goals tend to be adopted. In contrast, when self efficacy for mastery goals is low, performance goals tend to be adopted.

This central finding of the study is collaborated by looking at the within subject differences in self-efficacy across courses for which different goals were reported. Goal stability rates for those reporting on two classes were found to be 63%, thus leaving a substantial minority of participants who reported different goals for different classes. Among these students, we found that the changes in their goals were associated with concurrent changes in their mastery self-efficacy but not their performance self efficacy. Participants who reported a mastery goal for one class and a performance goal for another had significantly higher levels of self-efficacy for mastery goals in the class for which they adopted mastery goals as compared to the class for which a performance goal was adopted.

The reasons as to why self-efficacy for mastery goals is related to goal adoption can be understood through a basic tenet of social cognitive theory. This idea being that individuals engage goals in which they think they can attain and choose to ignore goal pursuits for which they are unsure of their ability to attain. (Bandura, 1997). It may be the case that those individuals with high self-efficacy for mastery approach goals chose mastery goals because they thought they could be successful in attaining those mastery goals. Conversely, individuals with a low level of self-efficacy for mastery approach goals may have chosen performance goals over mastery goals due to their lack of self efficacy to attain a mastery outcome. Cognitive dissonance theory (Festinger, 1957) informs us that a devaluation of an outcome can occur when it is clear that outcome may not be attainable. To endorse our performance approach goal, “ I’d rather do well in this class than learn a lot”, means to devalue the mastery outcome of “learning a lot”. This

devaluation could be related to the lack of mastery self-efficacy.

In contrast, self-efficacy for performance goals had nothing to do with goal adoption. One possible reason for this may be that the mastery or performance choice, especially as conceived of in the present study, was not viewed as a choice between equally attractive options. If they were, then the goal for which the individual held the highest level of self-efficacy may have predicted goal adoption better for performance goals. However, if the mastery approach goal option was generally seen as a more attractive goal than the performance approach option, then the participant's level of self-efficacy for performance goals, the weaker option, would naturally have less to do with what goal is selected compared to the person's self-efficacy for the most attractive goal.

#### *Implicit Theories and Self-Efficacy*

One of the aims of the study was to investigate a possible connection between goal specific self efficacy and implicit theories, specifically between mastery self efficacy and holding an incremental theory of intelligence. The hypothesis is restated below.

H<sub>3a</sub>: Participants with an incremental theory of intelligence will report higher levels of self-efficacy for mastery approach goals than those who hold an entity theory.

Participant's levels of goal specific self-efficacy were compared across implicit theories. The findings were consistent with our hypothesis. Participants holding an incremental theory of intelligence had a higher level of mastery goal self efficacy (both approach and avoidance) than did participants who held an entity theory. This relationship did not hold for performance goal self efficacy; those holding an incremental theory did not have a higher level of self-efficacy for performance goals than those holding an entity theory. This finding demonstrates an important link between implicit

theories and self-efficacy that would not be apparent if self-efficacy were not measured in a goal specific fashion. In this context, self efficacy should not be conceptualized as a unitary construct. Implicit beliefs in the malleability of one's intelligence were related to self-efficacy beliefs in their own capacity to learn. They were not related to self-efficacy beliefs in their capacity to perform.

#### *Value of Measuring Self-Efficacy for Avoidance Goals*

Since this study measured self-efficacy for all four goals in the 2x2 goal framework, measures were obtained for participant's level of self-efficacy for mastery avoidance and performance avoidance goals. This study found little evidence for the value of measuring self-efficacy for avoidance goals. The construct of self-efficacy for performance avoidance had similar null relationships with achievement goals and implicit theories as did self-efficacy for performance approach goals. However, unlike its approach counterpart, self-efficacy for performance avoidance goals was not associated with gender and course relevancy. The construct of self-efficacy for mastery avoidance goals had similar relationships to achievement goals and implicit theories as did its approach counterpart. Neither of these avoidance domains of self-efficacy appeared to add value above what was obtained with the approach domains of goal specific self efficacy. Therefore the usefulness of including such measures in future research is uncertain.

#### *The Measurement of Avoidance Goals in an "Either Or" Methodology*

This study was unique in its attempt to measure all four of the goal choices in the 2x2 framework in a manner that pitted goals against each other, making participants chose the one goal of the four that is most fitting. This is in contrast to the more common

manner in which researcher measure goals, where the degree of commitment to each of the four achievement goals is measured separately. The current study pitted goals against each other to examiner the social cognitive correlates of goal choice, not just goal commitment. Earlier studies utilizing such methodology (Mueler & Dweck, 1998) only used a mastery verse performance goal dichotomy, and made no direct mention of avoidance goals. In the current study, very few participants reported holding performance avoidance goals for their class, which subsequently excluded them from most analysis. Due to this, it appears that the inclusion of avoidance goals in an “either or” goal measuring methodology was not beneficial.

### *Discussion of Study 2*

A total of 71 students participated in study 2. They were drawn from the same population as were the participants from study one, a large suburban community college. Also as in study 1, the data was collected either before or after class during the 3<sup>rd</sup> to 6<sup>th</sup> week of a 15 week winter semester.

In the Study 2, a manipulation was administered to prime either and entity or an incremental theory of intelligence. It was hoped that the prime would elicit changes in the participant’s implicit theories and that those changes would result in subsequent changes in goal specific self efficacy and goal adoption. Specifically, it was hypothesized that those participants receiving the entity prime would be more likely to report performance goals and that those participants receiving the incremental theory prime would be more likely to report mastery goals. The hypothesis are restated below.

H<sub>5c</sub>: Participants primed with an entity theory of intelligence will report performance approach and performance avoidance goals at a higher

frequency than those participants primed with an incremental theory of intelligence.

H<sub>5d</sub>: Participants primed with an incremental theory of intelligence will report mastery approach and mastery avoidance goals at a higher frequency than those primed with an entity theory.

Support was not found for these hypotheses. The prime the participants received appeared to have no effect on their goal adoption. It was also hypothesized that participants who received the incremental theory prime would show a higher level of self efficacy for mastery approach goals than those who received the entity theory prime.

H<sub>5b</sub>: Individuals who are primed with an incremental theory of intelligence will report a higher degree of self-efficacy for mastery approach goals than individuals who were primed with an entity theory of intelligence.

This hypothesis was also not supported. The prime had no effect on any of the domains of self efficacy.

These null findings may be attributable to one of two reasons. It may have been that the prime was successful in temporarily affecting their implicit theories but that this change was not associated with concurrent changes in the participant's achievement goals as was the case in past research (Dweck & Legget, 1988). This is a plausible interpretation of the results, considering that in our first study the participant's dispositional implicit theories were not found to be related to their achievement goals. However, participants who were primed with an incremental theory did not show higher levels of self-efficacy for mastery goals. This is in contrast to the results from the first study which showed higher levels of self-efficacy for mastery goals from participants who reported to have an incremental theory of intelligence.

Given this, it may be most likely that the primes were not powerfully enough to produce changes in the participant's implicit theories, which could explain why the primes had no effect on self efficacy for mastery goals. From the design of the study, it is not possible to determine which of these interpretations are correct. There was not a manipulation check to determine if the prime had affected the subject's implicit theories. This was not included in the study due to concerns of a testing threat to internal validity.

Study 2 did provide more evidence for the connection found between goal specific self-efficacy and achievement goal adoption in study 1, although this connection was of a different nature than what was originally hypothesized.

H<sub>5a</sub>: Within the sample of those exposed to the manipulation of their implicit theory, goal specific self efficacy will not be independent of achievement goal adoption. Specifically, the goal adopted for the class will be the goal in which the participant holds the highest degree of self efficacy.

In study 2 individuals who adopted mastery approach goals had significantly higher levels of self-efficacy for mastery approach goals than did individuals who adopted performance approach goals. No differences in levels of self-efficacy for performance goals were found between the groups of participants adopting different goals. This reinforces a central finding from the study 1, namely that self-efficacy for mastery goals is related to goal adoption, while levels of self-efficacy for performance goals are not.

### *Limitations*

A central limitation of the current research is that it did not contain any behavioral or performance measures, such as grades, study time, or other measures of study behavior. The current study is one that solely examined the relationships between self

reported social cognitive variables. By doing so the study is limited in its capacity to demonstrate how these patterns of social cognition are related to actual outcomes.

A second limitation of the study is that the results may only be of limited applicability to different populations beyond community college students. There may be differences in the achievement goals and self-efficacy between community college and university students. Therefore, it is possible that the connection between them may be of different nature depending on the achievement level of the population under study.

Lastly, the addition of avoidance goals into an “either or” goal choice methodology did not appear to add value and resulted in a much higher frequency of mastery avoidance goals being reported as compared to performance avoidance goals. This may have been detrimental to the study. Due to the fact that participants had to chose only one of the four options, it may be the case, that if only two goal options were given, one goal for a mastery orientation in general and one for a performance orientation in general, somewhat different results would have been obtained. Although the inclusion of the avoidance goals into our “either or” methodology may have not been helpful to the current study, there was value in empirically determining it for future research.

#### *Implications for Future Research*

In conclusion, the current study provides evidence for the validity of considering self-efficacy for mastery goals and self-efficacy for performance goals as separate, albeit related domains of personal efficacy. Therefore, in light of the current findings, distinctions between performance goal self-efficacy and mastery goal self-efficacy could be considered in future research. However, more work is needed to further validate this distinction. Also, since a weakness of the current study was the lack of outcome

measures, it is not known how behavioral or outcome measures such as grades, study time, and study strategies would be related to levels of self-efficacy for mastery goals as opposed to self-efficacy for performance goals. Furthermore, it is also unknown what predictive capabilities achievement goals would have, if any, on these outcomes beyond that of goal specific self-efficacy.

Future experimental research may also clarify and expand on the current findings regarding goal adoption and self-efficacy for mastery goals. It may be possible to differentially manipulate changes in participant's level of self efficacy for performance and mastery goals. In doing so support may be found for a causal link between ones level of self-efficacy for mastery goals and subsequent goal adoption. If such a link were found for mastery self-efficacy but not for performance self-efficacy, it could have practical implications for the work in classroom goal climate. If the goal of a teacher is to foster mastery goals for their students, it may be that it is more important to implement instructional strategies that focus on fostering self-efficacy for mastery instead of the teaching of an incremental theory of intelligence or focusing on student's self-efficacy for performance.

Lastly, the lack of support for the contention that achievement goals stem from implicit theories ought to be taken seriously by those writing about achievement motivation. The current study, along with the majority of research over the past decade, does not support this hypothesis. Future research may benefit from attempts to understand the effects of implicit theories through some other mechanism besides goals, such as attribution theory or possibly mastery goal self-efficacy.

**APPENDIX A****RESEARCH INFORMATION SHEET**

**Title of Study:** CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT GOAL CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT GOAL FRAMEWORK THROUGH SELF-EFFICACY THEORY

**Principal Investigator (PI):** Richard Lucido  
Educational Psychology  
(586) 776-7545

**Purpose:**

You are being asked to participate in a research study of thoughts, attitudes, and beliefs about academic achievement among college students. You are being asked to participate because you are enrolled in a course at this college.

**Study Procedures:**

If you decide to participate, you will be asked to complete some or all of the following questionnaire measures, the Theories of Intelligence Scale, a measure of achievement goal orientation, and a measure of self-efficacy. In addition, you may be asked to provide demographic information regarding your age and gender as well as your opinion regarding the relevance of your classes towards your major program of study. The total time to complete these questions is approximately 5 to 10 minutes.

Examples of items from the Theories of Intelligence Scale:

1. Your intelligence is something about you that you can't change very much.
2. You can learn new things, but you can't really change your basic intelligence.

You will be asked to rate each item on the survey from 1, indicating strongly disagree, to 6, for strongly agree. There are no right or wrong answers.

Examples of items from the measure of achievement goal orientation:

1. I would rather avoid looking like I don't understand than learning as much as I could in class.
2. It is more important for me to learn as much as I could in this class than it is to get the best grades.

You will be asked to indicate which statement most closely describes your goals for this class. There are no right or wrong answers.

**Title of Study:** CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT GOAL CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT GOAL FRAMEWORK THROUGH SELF-EFFICACY THEORY

**Principal Investigator (PI):** Richard Lucido  
Educational Psychology  
(586) 776-7545

Examples of items from the measure of goal specific self efficacy:

1. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class
2. \_\_\_\_\_ I may not be able to avoid doing poorly in this class

You will be asked to indicate your degree of agreement or disagreement with each item on this scale ranging from 1 strongly disagree to 100 for strongly agree. There are no right or wrong answers.

### **Benefits**

As a participant in this research study, there be no direct benefit for you; however, information from this study may benefit other people now or in the future.

### **Risks**

There are no known risks at this time to participation in this study

### **Costs**

There will be no costs to you for participation in this research study.

### **Compensation**

You will not be paid for taking part in this study.

**Title of Study:** CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT  
GOAL CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT  
GOAL FRAMEWORK THROUGH SELF-EFFICACY THEORY

**Principal Investigator (PI):** Richard Lucido  
Educational Psychology  
(586) 776-7545

**Confidentiality:**

You will be identified in the research records by a code number. The code number will not be linked to your identity.

**Voluntary Participation /Withdrawal:**

Taking part in this study is voluntary. You are free to not answer any questions or withdraw at any time. Your decision will not change any present or future relationships with Wayne State University or its affiliates.

**Participation:**

By completing the questionnaire you are agreeing to participate in this study.

**Questions:**

If you have any questions about this study now or in the future, you may contact Richard Lucido at the following phone number (586) 776-7545. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

**APPENDIX B****STUDY RECRUITMENT STATEMENT AND INSTRUCTIONS**

My name is Richard Lucido. I am a doctoral student in the Educational Psychology Program at Wayne State University. I am conducting a research investigation investigating the thoughts, attitudes, and beliefs of college students in regards to academic achievement. Participation in this study is open to everyone enrolled in the class who is at least 18 years of age.

You are being given a manila envelope containing one questionnaire and an information sheet providing detailed information about the study. Please read the information sheet first and then complete the questionnaire. You have the right not to participate in the study. Even if you start the questionnaire and wish to discontinue, you have the right to do so at any time. The questionnaire will take about 5 to 10 minutes to complete. The questionnaires are not all the same and some will take longer than others. All information provided is completely anonymous. Do not write your name or any other identifiable information anywhere on the questionnaires or the manila envelope. Please do not share your responses regarding this research study. By completing the questionnaire you are agreeing to participate in this study. I will be collecting the completed questionnaires when you are finished. Your participation in this research study is greatly appreciated.

**APPENDIX C****DEBRIEFING HANDOUT**

**Title of Study:** CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT GOAL CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT GOAL FRAMEWORK THROUGH SELF-EFFICACY THEORY

**Principal Investigator (PI):** Richard Lucido  
Educational Psychology  
(586) 776-7545

**Thank you for your participation in this study.**

**If you have completed survey form B you would have read the following:**

The purpose of this study is to investigate how college student's think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person has is, for the most part, a relatively fixed entity. While we can learn new things, we cannot change our innate intelligence. We know that in school some individuals will have an easier or more difficult time learning than will others based on this generally fixed level of ability preset in all of us. Given these disparities in individual's natural ability, it is important to help ensure that each student has the opportunity to reach their potential. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.

**If you have completed survey form C you would have read the following:**

The purpose of this study is to investigate how college students think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person processes is, for the most part, changeable. That is, for most people, working hard and learning new things can actually increase how intelligent they are. We know that at school some individuals will work hard to learn new things and thereby increase their intelligence. However, others will not, and consequently they will fall behind in the development of their basic intelligence. Given the import role effort and motivation has in determining your present level of intelligence, it is important to help ensure that each student has the opportunity to stay motivated. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.

**These statements were used to elicit different attitudes regarding the changeability of intelligence for the purpose of better understanding how they are related to academic goals and self confidence. In truth, there is a degree of both fixedness and**

**changeability within a person's intelligence. Both of the above statements were exaggerations.**

## APPENDIX D

## INSTRUMENTS

## Form A (page 1 of 6)

Participant # \_\_\_\_\_

For the course: \_\_\_\_\_

Gender: male \_\_\_\_\_ female \_\_\_\_\_

**Please answer the following questions pertaining to the class indicated above, the class you are sitting in now. If you are enrolled in more than one class this semester, please complete the additional copies of this survey in regards to each of the classes in which you are currently enrolled.**

This class is relevant to my major course of study:    yes    no

**Read each of the four statements and then choose which one most closely describes your goals for this class. Indicate your choice by circling the statement.**

Although I hate to admit it, I would rather do well in this class than learn a lot.

I would rather avoid looking like I don't understand than learning as much as I could in this class.

It is more important for me to learn as much as I could in this class than it is to get the best grades.

Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I'd like.

**Rate your degree of agreement with the follow three statements using the following scale.**

1	2	3	4	5	6
Strongly Agree	Moderately Agree	Agree	Disagree	Moderately Disagree	Strongly Disagree

1. \_\_\_\_\_ You have a certain amount of intelligence and you really can't do much to change it.
2. \_\_\_\_\_ Your intelligence is something about you that you can't change very much.

3. \_\_\_\_\_ You can learn new things, but you can't really change your basic intelligence.

**Form A (page 2 of 6)**

**Rate your degree of agreement by recording a number from 0 to 100 using the scale given below:**

**Strongly  
Disagree**

**Strongly  
Agree**

**0 10 20 30 40 50 60 70 80 90 100**

1. \_\_\_\_\_ I am confident that I could do better than most other students in this class.
2. \_\_\_\_\_ I think that I could do well compared to others in this class.
3. \_\_\_\_\_ I am confident in my ability to get a better grade than most of the other students in this class.
4. \_\_\_\_\_ I am confident in my ability to learn as much as possible from this class.
5. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class.
6. \_\_\_\_\_ I think that I could master the material presented in this class.
7. \_\_\_\_\_ I may not be able to avoid doing poorly in this class.
8. \_\_\_\_\_ I am unsure of my ability to avoid performing poorly in this class.
9. \_\_\_\_\_ I have little confidence that I could avoid performing poorly in this class.
10. \_\_\_\_\_ I don't think I will be able to learn all that I should in this class.
11. \_\_\_\_\_ I have little confidence that I will be able to understand the content of this class as thoroughly as I'd like.
12. \_\_\_\_\_ I doubt that I will be able to learn all that there is to learn in this class.

**Form A (page 3 of 6)**

**To be completed for an additional class you are currently taking. If you are enrolled in only one course this semester, your participation is completed.**

**Participant #** \_\_\_\_\_

**For the course:** \_\_\_\_\_

**Please answer the following questions pertaining to the class indicated above.**

This class is relevant to my major course of study:    yes    no

**Read each of the four statements and then choose which one most closely describes your goals for this class. Indicate your choice by circling the statement.**

Although I hate to admit it, I would rather do well in this class than learn a lot.

I would rather avoid looking like I don't understand than learning as much as I could in class.

It is more important for me to learn as much as I could in this class than it is to get the best grades.

Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I'd like.

**Rate your degree of agreement by recording a number from 0 to 100 using the scale given below:**

**Strongly  
Disagree**

**Strongly  
Agree**

**0    10    20    30    40    50    60    70    80    90    100**

1. \_\_\_\_\_ I am confident that I could do better than most other students in this class.
2. \_\_\_\_\_ I think that I could do well compared to others in this class.
3. \_\_\_\_\_ I am confident in my ability to get a better grade than most of the other students in this class.
4. \_\_\_\_\_ I am confident in my ability to learn as much as possible from this class.

**Form A (page 4 of 6)**

5. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class.
6. \_\_\_\_\_ I think that I could master the material presented in this class.
7. \_\_\_\_\_ I may not be able to avoid doing poorly in this class.
8. \_\_\_\_\_ I am unsure of my ability to avoid performing poorly in this class.
9. \_\_\_\_\_ I have little confidence that I could avoid performing poorly in this class.
10. \_\_\_\_\_ I don't think I will be able to learn all that I should in this class.
11. \_\_\_\_\_ I have little confidence that I will be able to understand the content of this class as thoroughly as I'd like.
12. \_\_\_\_\_ I doubt that I will be able to learn all that there is to learn in this class.

**Form A (page 5 of 6)**

**To be completed for a third class that you are currently taking. If you are enrolled in only two courses this semester, your participation is completed.**

**Participant #** \_\_\_\_\_

**For the course:** \_\_\_\_\_

**Please answer the following questions pertaining to the class indicated above.**

This class is relevant to my major course of study:    yes    no

**Read each of the four statements and then choose which one most closely describes your goals for this class. Indicate your choice by circling the statement.**

Although I hate to admit it, I would rather do well in this class than learn a lot.

I would rather avoid looking like I don't understand than learning as much as I could in this class.

It is more important for me to learn as much as I could in this class than it is to get the best grades.

Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I'd like.

**Rate your degree of agreement by recording a number from 0 to 100 using the scale given below:**

**Strongly  
Disagree**

**Strongly  
Agree**

**0    10    20    30    40    50    60    70    80    90    100**

1. \_\_\_\_\_ I am confident that I could do better than most other students in this class.
2. \_\_\_\_\_ I think that I could do well compared to others in this class.
3. \_\_\_\_\_ I am confident in my ability to get a better grade than most of the other students in this class.
4. \_\_\_\_\_ I am confident in my ability to learn as much as possible from this class.
5. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class.

**Form A (page 6 of 6)**

6. \_\_\_\_\_ I think that I could master the material presented in this class.
7. \_\_\_\_\_ I may not be able to avoid doing poorly in this class.
8. \_\_\_\_\_ I am unsure of my ability to avoid performing poorly in this class.
9. \_\_\_\_\_ I have little confidence that I could avoid performing poorly in this class.
10. \_\_\_\_\_ I don't think I will be able to learn all that I should in this class.
11. \_\_\_\_\_ I have little confidence that I will be able to understand the content of this class as thoroughly as I'd like.
12. \_\_\_\_\_ I doubt that I will be able to learn all that there is to learn in this class.

**Form B (page 1 of 2)**

Participant # \_\_\_\_\_

Course : \_\_\_\_\_

**The purpose of this study is to investigate how college student's think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person has is, for the most part, a relatively fixed entity. While we can learn new things, we cannot change our innate intelligence. We know that in school some individuals will have an easier or more difficult time learning than will others based on this generally fixed level of ability preset in all of us. Given these disparities in individual's natural ability, it is important to help ensure that each student has the opportunity to reach their potential. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.**

**Read each of the four statements and then choose which one most closely describes your goals for this class. Indicate your choice by circling the statement.**

Although I hate to admit it, I would rather do well in this class than learn a lot.

I would rather avoid looking like I don't understand than learning as much as I could in this class.

It is more important for me to learn as much as I could in this class than it is to get the best grades.

Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I'd like.

**Form B (page 2 of 2)**

**Rate your degree of agreement by recording a number from 0 to 100 using the scale given below:**

**Strongly  
Disagree**

**Strongly  
Agree**

**0 10 20 30 40 50 60 70 80 90 100**

1. \_\_\_\_\_ I am confident that I could do better than most other students in this class.
2. \_\_\_\_\_ I think that I could do well compared to others in this class.
3. \_\_\_\_\_ I am confident in my ability to get a better grade than most of the other students in this class.
4. \_\_\_\_\_ I am confident in my ability to learn as much as possible from this class.
5. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class.
6. \_\_\_\_\_ I think that I could master the material presented in this class.
7. \_\_\_\_\_ I may not be able to avoid doing poorly in this class.
8. \_\_\_\_\_ I am unsure of my ability to avoid performing poorly in this class.
9. \_\_\_\_\_ I have little confidence that I could avoid performing poorly in this class.
10. \_\_\_\_\_ I don't think I will be able to learn all that I should in this class.
11. \_\_\_\_\_ I have little confidence that I will be able to understand the content of this class as thoroughly as I'd like.
12. \_\_\_\_\_ I doubt that I will be able to learn all that there is to learn in this class.

**Form C (page 1 of 2)**

Participant # \_\_\_\_\_

Course : \_\_\_\_\_

**The purpose of this study is to investigate how college students think and feel about their classes. This research is especially important in light of the scientific evidence supporting the idea that the amount of intelligence a person processes is, for the most part, changeable. That is, for most people, working hard and learning new things can actually increase how intelligent they are. We know that at school some individuals will work hard to learn new things and thereby increase their intelligence. However, others will not, and consequently they will fall behind in the development of their basic intelligence. Given the import role effort and motivation has in determining your present level of intelligence, it is important to help ensure that each student has the opportunity to stay motivated. The insight that could be gained from investigating how you think and feel about your classes may in the future lead to more effective educational practices and interventions. Thank you for your participation in this research.**

**Read each of the four statements and then choose which one most closely describes your goals for this class. Indicate your choice by circling the statement.**

Although I hate to admit it, I would rather do well in this class than learn a lot.

I would rather avoid looking like I don't understand than learning as much as I could in this class.

It is more important for me to learn as much as I could in this class than it is to get the best grades.

Rather than getting the best grades, my goal is to avoid failing to understand the content of this class as thoroughly as I'd like.

**Form C (page 2 of 2)**

**Rate your degree of agreement by recording a number from 0 to 100 using the scale given below:**

**Strongly  
Disagree**

**Strongly  
Agree**

**0 10 20 30 40 50 60 70 80 90 100**

1. \_\_\_\_\_ I am confident that I could do better than most other students in this class.
2. \_\_\_\_\_ I think that I could do well compared to others in this class.
3. \_\_\_\_\_ I am confident in my ability to get a better grade than most of the other students in this class.
4. \_\_\_\_\_ I am confident in my ability to learn as much as possible from this class.
5. \_\_\_\_\_ I am confident that I could gain a thorough understanding of the content of this class.
6. \_\_\_\_\_ I think that I could master the material presented in this class.
7. \_\_\_\_\_ I may not be able to avoid doing poorly in this class.
8. \_\_\_\_\_ I am unsure of my ability to avoid performing poorly in this class.
9. \_\_\_\_\_ I have little confidence that I could avoid performing poorly in this class.
10. \_\_\_\_\_ I don't think I will be able to learn all that I should in this class.
11. \_\_\_\_\_ I have little confidence that I will be able to understand the content of this class as thoroughly as I'd like.
12. \_\_\_\_\_ I doubt that I will be able to learn all that there is to learn in this class.

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**ABSTRACT****CAN GOAL SPECIFIC SELF-EFFICACY MEASURES PREDICT GOAL CHOICE: UNDERSTANDING THE 2X2 ACHIEVEMENT GOAL FRAMEWORK THROUGH SELF-EFFICACY THEORY**

by

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The achievement goals that one adopts in an academic context have been shown to be associated with, as well as causally related to, important outcomes. Currently, the most widely accepted theory holds that achievement goals are the result of one's implicit theory of intelligence. However, there is a lack of empirical support for this assertion. The current study tested the hypothesis that goal specific self-efficacy (self-efficacy measured separately for a mastery or performance outcome) is the primary driver of achievement goals. Two studies were conducted among a combined sample of 274 community college students. As was the case with most recent research, the current study found no support for the contention that achievement goals are related to implicit theories. In contrast, self-efficacy for mastery goals appeared to be predictive of goal adoption, where high levels of mastery goal self-efficacy were related to the adoption of mastery goals and low levels related to the adoption of performance goals. Self-efficacy for performance goals were found to be unrelated to goal adoption. In addition, when

students reported different goals among the courses in which they were currently enrolled, congruent differences in their degree of mastery goal self-efficacy were found.

This finding provides evidence that mastery self-efficacy has the potential to explain some of the contextual malleability of goals, a feat which implicit theories of intelligence are inherently unable to match.

## **AUTOBIOGRAPHICAL STATEMENT**

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