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Falling Short of Goals: The Role of Achievement Goals in College Student Cognitive Motivation

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FALLING SHORT OF GOALS: THE ROLE OF ACHIEVEMENT GOALS IN COLLEGE STUDENT COGNITIVE MOTIVATION

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Dedication

To my amazing husband, Phillip, and to my little one, Mark, you are my inspiration. I love you two more than you can imagine.

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Abstract

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Much of what is known about students' cognitive motivation through self-reactive influences has been derived from studies not conducted in academic settings. The present study sought to fill the gap in the literature by examining college students' cognitive motivation within a natural classroom environment. Specifically, an integrated model of intended effort was developed to further understand the relationship between negative performance-goal discrepancy, self-reactive influences and intended effort toward next proximal goal. In addition, the role of achievement goals on self-reactive influences and intended effort was explored using the 2 × 2 achievement goal framework. Results from a path model analysis involving four hundred and fifty-one undergraduates suggest that, among other things, future affective self-evaluation is more predictive of intended effort than performance-goal discrepancy or self-efficacy toward original goal attainment. Proximal goal failed to explain any more variance in intended effort. The performance-goal discrepancy had a direct effect on both future affective self-evaluation and self-efficacy, but did not exert a direct effect on proximal goals. The analyses also revealed the significant main effects of each of the four types of achievement goals on both self-efficacy and proximal goals. However, mastery-approach goals were the only goals to exert a significant main effect on intended effort and none of the achievement goals exerted a direct influence on future affective self-evaluation. An interaction between the discrepancy and performance-approach achievement goals and an interaction between the discrepancy and performance-avoidance achievement goals partially predicted future

affective self-evaluation. An interaction between discrepancy and mastery-approach achievement goals partially explained self-efficacy toward the original goal.

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Chapter 1: Introduction

For several decades, educational researchers have been striving to answer what motivates students to pursue academic goals. Specifically, cognitive motivation, or the motivation that involves an active processing and analysis of information on the part of the individual, has been explored in many ways. When examining cognitive motivation based on goal intentions, goal theorists, social cognitive theorists and achievement goal theorists offer various explanations for how students motivate themselves toward the pursuit of academic tasks.

Goal theorists suggest positive outcomes with respect to cognitive motivation when students set challenging and specific goals (Ambrose & Kulik, 1999; Latham & Locke, 2006; Locke & Latham, 2002; Mento, Steel, & Karren, 1987; Tubbs, 1986; Wood, Mento, & Locke, 1987). Social cognitive theorists also recognize the influence of challenging and specific goals on cognitive motivation, but argue that the motivational power of goals emanates not from the goals themselves, but from the influence of three self-reactive influences: (1) future affective self-evaluation, (2) perceived self-efficacy for goal attainment, and (3) self-set goals (Bandura, 1986, 1988; Bandura & Cervone, 1983). In another effort to explain student motivation, achievement goal theorists have linked different types of achievement goals to various motivation levels (Ames, 1992; Dweck, 1986; Elliot & Dweck, 1988; Meece, Blumenfeld, & Hoyle, 1988) as well as two of the three self-reactive influences − self-efficacy (e.g., Wolters, Yu, & Pintrich, 1996) and self-set goals (e.g., Donovan & Swander, 2001).

The present study primarily drew from the social cognitive literature as well as from the achievement goal literature to better explain how students remain motivated

toward the pursuit of future academic tasks after they receive negative performance feedback. (i.e., react to negative performance-goal discrepancies). Specifically, this study aimed to examine the role that self-reactive influences and achievement goals play in student cognitive motivation. In the remaining sections, a review of related gaps in the literature followed by a detailed description of the purpose of the present study, research questions and general hypotheses are provided.

Background and Statement of the Problem

From a social cognitive perspective, self-reactive influences (future affective self-evaluation, perceived self-efficacy for goal attainment, and self-set goals) reside at the heart of cognitive motivation as they mediate the effects of performance feedback on effort (Bandura, 1991a). In the context of students who have just received performance feedback on an exam (i.e., their grade) in a particular class, future affective self-evaluation refers to the feelings these students would experience if they were to achieve the same grade as the one they just received, on their next exam. Perceived self-efficacy for goal attainment refers to the level of confidence students have regarding the attainment of future academic goals in that particular class. Self-set goals refer to goals (i.e., minimum satisfactory grades) students set for themselves for the class in response to the performance feedback. Thus, whether negative performance feedback are motivating or discouraging is assumed to be influenced by individuals' anticipated emotions regarding future performance feedback (i.e., future affective self-evaluation), beliefs that they can attain their goals (i.e., self-efficacy) and, future goals that they set for themselves (i.e., self-set goals) (Bandura, 1988).

The motivational power of each of the three self-reactive influences on cognitive motivation and their intercorrelations with each other have been documented at various levels of performance-goal discrepancy (e.g., Bandura & Cervone, 1986). However, our current understanding of how students motivate themselves in the pursuit of academic goals is impeded by two major gaps in the literature. First, the majority of studies on cognitive motivation through self-reactive influences have not been conducted in a classroom setting. Findings from such studies may therefore not be generalizable to students' cognitive motivation as they engage in academic tasks. Second, little is known about the antecedents of self-reactive influences. Personal characteristics may play a significant role in explaining individual differences in the self-reactive influences that determine cognitive motivation. The following paragraphs will describe these gaps in further detail.

Most of what is known about self-reactive influences and cognitive motivation is derived from studies that have been conducted in a setting other than the classroom. For example, Cervone, Jiwani, and Wood (1991) examined the effects of self-efficacy and affective self-evaluation on a managerial decision-making simulation. Bandura and Cervone (1983, 1986) measured the impact of self-reactive influences on changes in motivation among students using an ergometer, an exercise device requiring effortful activity. Similarly, Donovan and Williams (2003) as well as Williams, Donovan, and Dodge (2000) conducted their studies using physical tasks. Ilies and Judge (2005) examined the effects of performance-feedback on goals in an organizational setting. There are reasons to believe that results from such studies may not be applicable to students' motivation toward the attainment of academic goals. For instance, as it has

been shown that individuals interpret and adjust effort based on their conception of their cognitive ability (Dweck & Leggett, 1988), caution seems reasonable when drawing conclusions about students' cognitive motivation from studies not based on cognitive academic tasks. Physical and managerial tasks may activate different cognitive processes than the ones triggered by academic tasks, or at the very least, these may impact behavior differently in educational contexts. Research in a classroom setting based on cognitive tasks is therefore necessary to get a better understanding of students' academic cognitive motivation.

Another restriction to most of the non-classroom setting studies involving cognitive motivation based on goal intentions is that participants often do not set their own goals and receive prearrange feedback. For example, in Bandura and Cervone's (1986) study, participants did not choose which goal to pursue "because those who choose high goals [were] likely to differ on other personal characteristics from those who opt[ed] for low goals" (p. 97). Unbeknownst to the participants, they selected their goal from a bag only containing identical goal cards. In addition, performance feedback is often prearranged. That is, in most studies (e.g., Bandura & Cervone, 1983, 1986), performance feedback was independent of the participants' actual performance.

The current study argues that while controlling participants' goal setting and performance feedback may not impact the relationships between self-reactive influences and cognitive motivation, it alters self-reactive influence measures which are influenced by the performance-goal discrepancy. For example, students who do not set their goals are likely to react to performance feedback differently than students who set their own goals, because self-set goals have been shown to enhance goal commitment (Schunk,

1991). Following a negative performance-goal discrepancy, they may report less dissatisfaction (i.e., affective self-evaluation) than students who would have set their own goals and who might have been more committed to their goals. Similarly, because self-set goals have been shown to promote self-efficacy (Schunk, 1985), students who set their own goals would be expected to report higher levels of self-efficacy beliefs following negative performance feedback than students who would have been assigned goals.

Another related limitation of goal-setting and cognitive motivation research not conducted in academic settings is that most studies are conducted over short periods of time. This type of research can study basic processes, but do not fully represent the nature of student academic motivation as academic goals, such as earning a degree, achieving an "A" in a class, or completing a research paper, usually require longer time and commitment. The current study posits that in order to better understand cognitive motivation, individual differences such as goals and performance should not be controlled for, but rather allowed to naturally deviate as they do in a classroom. Further, this study makes the point that research is needed to explore cognitive motivation over longer periods of time. Doing so will result in a more generalizable and comprehensive model which will account for some individual differences.

Individual differences within self-reactive influences have been identified in previous studies. For instance, Bandura and Cervone (1986) uncovered significant differences in both perceived self-efficacy and self-set goals between individuals at each discrepancy level. For example, in the case of a small negative performance-goal discrepancy (participants' performance was 4% below their goal), about 40% of

participants reported low self-efficacy, 15% reported moderate level of self-efficacy and 45% reported high self-efficacy. Similarly, while about 35% of the participants lowered their goal, 15% maintained their goal and 50% increased their goal. These results suggest the presence of powerfully influential individual differences. Bandura and Cervone (1986) focused on the relationship between self-reactive influences and subsequent cognitive motivation and did not provided a rationale for the individual differences they had identified.

Partially, studies on achievement goals have been able to explain variance in effort levels as well as in two of the three self-reactive influences between individuals. For example, mastery goals have been linked to higher self-efficacy (e.g., Wolters et al., 1996) and greater effort (e.g., Ames, 1992; Dweck, 1986; Elliot & Dweck, 1988; Meece et al., 1988), whereas performance goals have been associated with greater goal revision (e.g., Donovan & Swander, 2001; Donovan & Hafsteinsson, 2006) and lower effort (e.g., Ames, 1992; Dweck, 1986; Elliot & Dweck, 1988; Meece et al., 1988). However, no link between achievement goals and affective self-evaluation has been explored. Moreover, no study has explored achievement goals as possible antecedents to all three self-reactive influences combined.

The current study posits that integrating insights from the achievement goals literature with findings from the social cognitive theory literature will contribute to a more comprehensive understanding of cognitive motivation. However, such an endeavor is complicated by the fact that the concept of goal orientation has evolved over the years from a dichotomous framework (mastery, learning or task-involved vs. performance or ego-involved goal orientation) (e.g., Ames, 1992; Diener & Dweck, 1978, 1980; Dweck

& Leggett, 1988) through a trichotomous framework (mastery goals, performance-approach goals and performance-avoidance goals) (Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997) to a 2 × 2 achievement goal framework (mastery-approach, mastery-avoidance, performance-approach and performance-avoidance) (Elliot, 1999; Elliot & McGregor, 2001; Elliot & Murayama, 2008; Finney, Pieper, & Barron, 2004; Pintrich, 2000a; 2000b), and most recently, even a 3 × 2 framework (Elliot, Murayama, & Pekrun, 2011). The predominant theory today is the 2 × 2 achievement goal framework which distinguishes between approach and avoidance for both mastery and performance goals.

Despite the fact that the goal orientation construct has received much attention since Ames, Dweck and colleagues' early work (Ames, 1992; Dweck, 1986, 1992; Dweck & Leggett, 1988), the specific impact of the four achievement goals derived from the 2 × 2 achievement goal orientation framework has received minimal examination to date. Most of the few studies linking achievement goals to self-reactive influences have been based on the dichotomous goal orientation framework. As a result not much is known about the influence of the four achievement goals on any one self-reactive influence, let alone all three. More research exploring the links between the four types of achievement goals to self-reactive influences is needed.

The limited amount of studies conducted within authentic classroom settings and the lack of emphasis on individual differences in cognitive motivation makes it especially difficult for educators to understand what motivates students through their pursuit of academic tasks. Implementing efficient motivation techniques adapted to students' needs is therefore particularly challenging. By better understanding the role of individual

characteristics and self-reactive influences on cognitive motivation, educators could improve the motivational power of goal setting which could in turn lead to higher achievement and lower drop-out rates. Understanding how these factors directly impact student cognitive motivation within academic settings is essential if researchers and educators are to continue integrating empirical knowledge with educational practice (McNamara, 2006). Achieving a better knowledge of what motivates students is especially salient when it comes to college students' as evidence shows that up to 27% of college freshmen do not complete their first year (Cravatta, 1997; Feldman, 2005; Geraghty, 1996).

Purpose of the Study

To help address the need for a better understanding of students' cognitive motivation, the current study used insights from goal theory, social cognitive theory and achievement goal theory. Above all, this study aimed to better explain how students motivate themselves after they fail to achieve their pre-set goals. That is, to answer how students stay motivated to achieve academic tasks (i.e., satisfactory overall course grade) after receiving negative performance feedback (i.e., negative performance-goal discrepancies on their first exam). Specifically, the present study explored the mediating role of the self-reactive influences on the relationship between the negative performance-goal discrepancies and cognitive motivation while addressing the limitations present in the literature by focusing on the authentic classroom setting. The relationships between each of the three self-reactive influences themselves were also addressed.

Central to the present study is the argument that achieving a more comprehensive view of cognitive motivation is not possible without considering students' personal

characteristics. The present study was the first study to explore students' achievement goals as a possible source of variance in all three self-reactive influences and cognitive motivation in the context of negative performance-goal discrepancies. The present study used the 2 × 2 achievement goal framework (Elliot & McGregor, 2001) which consists of four types of achievement goals: mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals.

Research Questions and General Research Hypotheses

The present study investigated the influence of achievement goals and self-reactive influences on college students' cognitive motivation (measured as intended effort) in the context of negative performance-goal discrepancies. The following broad research questions guided the study: (1) How do self-reactive influences impact cognitive motivation in the classroom environment? (2) What are the roles of student achievement goals within cognitive motivation?

The model (see Figure 1) developed for this study tested the following overarching hypotheses: (1) The self-reactive influences (i.e., future affective self-evaluation, perceived self-efficacy for goal attainment, and self-set goal) mediate the effects of the negative performance-goal discrepancies on intended effort; (2) Achievement goals influence intended effort in the context of negative performance-goal discrepancies through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences.

This chapter presented a brief overview of cognitive motivation, emphasizing the role of self-reactive influences. The concept of achievement goals was introduced as a

potential source of variance explaining differences in self-reactive influences among individuals. The gaps in the literature, purpose of the present study, research questions, hypotheses and conceptual model were also outlined. In the next chapter, a more extensive review of the literature will be provided.

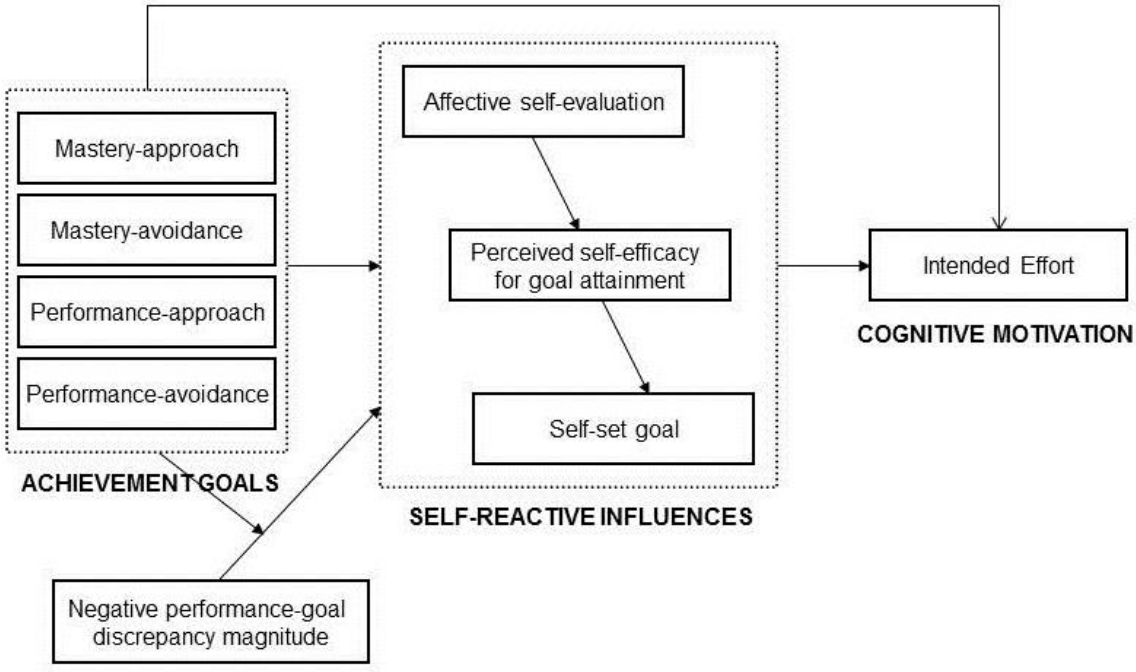

Figure 1. Conceptual model

Chapter 2: Literature Review

Theorists and educators alike have been striving to understand how students motivate themselves toward the pursuit of academic goals for decades. Social cognitive theorists suggest that performance feedback influences student effort through the activation of three cognitive and affective factors called self-reactive influences (Bandura & Cervone, 1986). Several studies examined the role of self-reactive influences in cognitive motivation in non-academic settings (e.g., Bandura & Cervone, 1983, 1986; Donovan & Williams, 2003; Ilies & Judge, 2005; Williams et al., 2000). There is reason to believe that results from such studies might not be generalizable to student cognitive motivation. Further, to date, little is known about the factors that could explain differences in cognitive motivation between individuals. The present study sought to fill the gap in the literature by examining college students' cognitive motivation within a natural classroom environment while considering student achievement goals as a source of variance in student cognitive motivation.

The theoretical framework used in the current study consists of two major conceptual components. Hence, this chapter is divided along each of these two components. The first section of this review of literature examines research related to cognitive motivation. Specifically, a social cognitive framework is used to highlight the role of each of the three self-reactive influences in cognitive motivation. The second section focuses on research related to achievement goal theory. Beginning with an overview of the evolution of the goal orientation construct, this section primarily centers on the link between achievement goals and self-reactive influences, and between achievement goals and effort. Combined, these two sections will provide relevant

background for the present study hypotheses and hypothesized model. The hypotheses formulated for the present study are presented along with the supporting literature and summarized at the end of this chapter.

Cognitive Motivation: A Social Cognitive Framework

In general, cognitive motivation assumes that behavior results from an active processing and analysis of information on the part of the individual, rather than being driven by innate and predetermined sets of processes. Cognitive motivation fits within the larger framework of self-regulation, which refers to the systematic effort to direct one's thoughts, feelings, and actions toward the attainment of goals (Zimmerman, 2000). Self-regulation has been shown to be instrumental in student learning and achievement (Corno & Mandinach, 1983; Corno & Rohrkemper, 1985).

Based on Piaget's theory of cognitive development (1936), Deci (1975) initially conceived of cognitive motivation as the process of weighing the costs and benefits of undertaking a task, whether it is pursued for internal reasons (i.e., intrinsic motivation), external reasons (i.e., extrinsic motivation), or a combination of the two. Since this initial conception, cognitive motivation has been studied from various perspectives. Specifically, Bandura and colleagues (Bandura, 1986, 1988; Bandura & Cervone, 1983; 1986) employed a social cognitive perspective and focused on cognitive motivation through self-reactive influences. That conceptualization was the one adopted in the present study to examine student cognitive motivation in the case of negative performance feedback.

Contrary to the behaviorist view that focuses on the stimulus-response relationship, the social cognitive theory assumes that people are not only reacting to prior

environmental forces or driven by inner impulses, but also are more realistically self-reflective, self-organizing, proactive, and self-regulating regarding their future performance and the factors that influence their future performance (Bandura, 1986; Pajares, 2006). Further, social cognitive theorists believe that individuals motivate themselves and guide their actions in an anticipatory proactive way through the ongoing exercise of forethought (Bandura, 1986, 1988, 1991b; Zimmerman, 2000). It is during the process of forethought that individuals initially set goals for themselves (Bandura & Cervone, 1983), anticipate the outcomes of prospective actions, and plan subsequent courses of action to achieve anticipated outcomes.

In academic settings, social cognitive theory suggests that students draw from past and current classroom experiences, including those related to receiving performance feedback (e.g., exam grades), to make informed decisions on how to proceed toward future academic goals. Subsequent academic goals, whether new or revised, come out of this planning and evaluation process. Consistent with expectancy-value theory (e.g., Atkinson, 1964; Fishbein, 1967; Rotter, 1954; Vroom, 1964), students, then, guide their actions toward these goals anticipatorily based on the outcomes they expect to arise from given courses of actions, such as spending a specific amount of time studying for tests, or in using related learning strategies. Thus, under the social cognitive paradigm, anticipated future outcomes are converted into current motivators and regulators of behaviors (Bandura, 1988). More specifically, social cognitive theorists argue that forethought gives rise to behaviors through three types of self-reactive influences: (1) future affective self-evaluation, (2) perceived self-efficacy for goal attainment, and (3) self-set goals (Bandura, 1986, 1988; Bandura & Cervone, 1983, 1986). Before

addressing the motivational power of each of the three self-reactive influences, it is important to note that the activation of self-reactive influences is not automatic and depends on context. The following paragraphs will highlight the conditions necessary to activate self-reactive influences.

Cognitive Comparison Process

Bandura and Cervone (1983) showed that future affective self-evaluation and perceived self-efficacy for goal attainment had a strong motivational influence only when individuals were able to compare their performance to their personal goals (i.e., analyze the performance-goal discrepancy). Accordingly, setting goals alone without getting performance feedback information, or receiving feedback without having set a goal, had no influence on motivation level (Bandura & Cervone, 1983). Therefore, in their study, Bandura and Cervone (1983) concluded that cognitive motivation through self-reactive influences relies on a cognitive comparison process in which individuals compare their performance to their pre-set goal. This cognitive comparison process might occur in academic settings when students receive performance-feedback and compare their received grade (i.e., performance) to the grade they had hoped to achieve (i.e., pre-set goal).

The importance of this cognitive comparison process in cognitive motivation was subsequently emphasized by goal theorists. For instance, Locke and Latham added that "goal setting […] is usually only effective when feedback allows performance to be tracked in relation to one's goals" (Locke & Latham, 1990, p. 241) and that "goals and feedback together are more effective in motivating high performance or performance improvement than either one separately" (Latham & Locke, 1991, p. 226). Furthermore,

Mento et al.'s (1987) meta-analysis supported the beneficial effects of performance feedback in goal setting environments. In essence, their study provided support for the motivational power of combining specific difficult goals with feedback versus specific difficult goals without feedback.

Self-Reactive Influences

In contexts in which goal settings and performance feedback exist, Bandura and Cervone (1986) demonstrated that self-reactive influences mediate the motivational power of goal setting. That is, they showed that self-reactive influences impacted the relationship between the performance-goal discrepancy and cognitive motivation. The following paragraphs will address each of the three self-reactive influences that occur as a result of the cognitive comparison: (1) future affective self-evaluation, (2) perceived self-efficacy for goal attainment and, (3) self-set goals. Of particular relevance to the proposed model of the present study, it was hypothesized that student perceptions, as manifested in the three self-reactive influences, would mediate the relationship between negative performance feedback and cognitive motivation.

In their seminal studies on cognitive motivation through self-reactive influences, Bandura and Cervone (1983, 1986) measured "cognitive motivation" as change in effort. Precisely, an ergometer measured the percentage change in effort after performance feedback relative to that of prior to performance feedback. In the present study, Bandura and Cervone's (1983, 1986) conception was also used. As such, students were asked to indicate their intended effort toward Exam 2 (i.e., cognitive motivation) in terms of how much more or less effort they would exert relative to the effort they exerted toward Exam 1. Thus, in the remainder of this section, hypotheses will be formulated as to how each of

the three self-reactive influences was expected to be influenced by the magnitude of the negative performance-goal discrepancies and as to how each of the self-reactive influences was expected to impact students' reported intended effort.

Future affective self-evaluation. Future affective self-evaluation explains how affect can impact motivation. Bandura and Cervone (1986) showed that affective self-evaluation for subsequent tests (i.e., future affective self-evaluation) rather than the affective self-evaluation for past test is the critical motivator. The anticipated self-satisfaction from achieving a goal as well as the anticipated self-dissatisfaction resulting from failing to attain a goal both motivate people to pursue the valued goal (Bandura, 1988). However, following negative performance feedback, anticipated self-dissatisfaction, not self-satisfaction, seems to prompt people to increase their efforts (Bandura & Cervone, 1986). Thus, in educational settings, students who would be quite content to do as well as they did on a previous exam would be expected to exert less effort toward their future exam than those who would be highly dissatisfied if they were to do no better on their next exam than they did on their previous exam. In fact, students could be pleased with their prior performance, but self-dissatisfied if they were to fail to improve their performance on their next exam. For example, consider a student who was satisfied in obtaining an 88 (a B+) on his first exam. Self-dissatisfaction in achieving a B+ again on his second exam would lead the student to mobilize more effort toward the second exam than would satisfaction with another B+ performance.

In their study involving a strenuous exercise, Bandura and Cervone (1986) showed that participants' future affective self-evaluation varied as a function of discrepancy levels. In their study, Bandura and Cervone (1986) manipulated

participants' goal setting and performance feedback to create four different discrepancy conditions: (1) a large substandard condition (-26% below goal), (2) a moderate substandard condition (-14% below goal), (3) a small substandard condition (-4% below goal) and, (4) a small suprastandard condition (+4% above goal). As expected, participants were self-dissatisfied with a large substandard performance, but as the negative performance-goal substandard discrepancy narrowed and evolved into small suprastandard discrepancy, participants became more self-satisfied with their performance ($F(3,76) = 3.52$, $p < .02$). On a 25-interval scale, ranging from highly self-satisfied (1) to highly self-dissatisfied (25), participants reported a self-dissatisfaction mean level of 12.55 ($SD = 6.07$), 10.90 ($SD = 4.63$), 9.45 ($SD = 5.61$) and 7.30 ($SD = 4.65$) for the large substandard condition, moderate substandard condition, small substandard condition and small suprastandard condition respectively. Post-hoc tests determined that participants in the large substandard condition were significantly more dissatisfied with their performance than participants in the small substandard condition ($t(76) = 1.86$, $p < .04$) and participants in the small suprastandard condition ($t(76) = 3.15$, $p < .001$). Additionally, participants in the small suprastandard condition were significantly more satisfied with their performance than participants in the moderate substandard condition ($t(76) = 2.16$, $p < .02$) or participants in the small substandard condition ($t(76) = 1.29$, $p < .10$). No significant differences were identified between the large substandard and moderate substandard conditions as well as between the moderate and small substandard conditions.

In the present study which focused on negative performance-goal discrepancies, the variable of interest was future affective self-evaluation (i.e., a student's anticipated

satisfaction with his/her grade on Exam 2 if he/she were to obtain the same grade as Exam 1). It was therefore hypothesized that increased discrepancies would lead to lower levels of future affective self-evaluation (i.e., higher level of dissatisfaction). Stated differently, it was expected that a student's future self-evaluation would increase as he/she approached his/her pre-set goal. The following hypothesis was formulated:

> *Hypothesis 1*: The magnitude of the negative performance-goal discrepancies will have a direct negative effect on future affective self-evaluation.

In addition to showing that future affective self-evaluation was highly dependent upon the performance-goal discrepancy condition, Bandura and Cervone (1986) also found that future affective self-evaluation exerted differential impact on motivation as a function of the level and direction of the performance-goal discrepancy. In the cases of large (-26%) and moderate (-14%) negative performance-goal discrepancies, participants reported higher levels of future self-dissatisfaction and were in turns more likely to increase their effort. In fact, future self-dissatisfaction was a significant contributor to effort change in the case of large and moderate negative performance-goal discrepancies ($r = .53$, $F = 10.65$, $p < .005$ and $r = .44$, $F = 6.68$, $p < .025$ respectively). This factor explained 29% and 19% of variance in effort changes for the large substandard and moderate substandard conditions respectively. However, participants in the small substandard condition (-4%) and small suprastandard condition (+4%), who stated that they would be quite satisfied with approximating (-4%) or barely exceeding (+4%) their subsequent goal did not increase their subsequent effort. Bandura and Cervone (1986) therefore concluded that anticipated self-dissatisfaction, not self-satisfaction, prompted people to increase their efforts.

In the proposed model which controlled for the magnitude of the negative performance-goal discrepancies, future affective self-evaluation was thus expected to exert a direct negative effect on intended effort. In other words, it was expected that upon receiving negative feedback on Exam 1, students who would report that they would be quite satisfied to perform on Exam 2 as well as they did on Exam 1 would report lower levels of intended effort toward Exam 2 than those who would report that they would be highly dissatisfied if they were to do no better than they did on Exam 1.

Hypothesis 2: Future affective self-evaluation will have a direct negative effect on intended effort.

Perceived self-efficacy for goal attainment. Perceived self-efficacy for goal attainment is the second self-reactive influence that plays a critical role in the exercise of self-regulation over motivation (Bandura, 1988). Beliefs of self-efficacy determine which activities students decide to undertake or avoid, how much effort student will expend, and how long students will persist in the face of obstacles (Bandura, 1977, 1986, 1995). People are more prone to undertake tasks they believe they have the ability to accomplish, and avoid tasks they believe they lack skills to achieve. Whether negative performance-goal discrepancies are motivating or discouraging is partly decided by people's beliefs that they can attain the goals they set for themselves (Bandura, 1988). For example, a student who fails to attain the goal he had set for himself for the first test of a given class may (1) feel relatively unsure that he could still achieve his minimum satisfactory overall course grade and consequently disengage from the class, or (2) perceive that achieving his minimum satisfactory grade for the course is still within his reach and consequently intensify his effort.

The causal link between strong perceived self-efficacy and heightened levels of effort and perseverance in difficult tasks has been established by many studies in several different contexts. For example, Zimmerman, Bandura, and Martinez-Pons (1992) showed that students with high self-efficacy set higher goals and expend more effort toward the achievement of these goals than students with low self-efficacy. Several studies manipulated self-efficacy beliefs in order to demonstrate their impact on motivation. In one study, Cervone and Peake (1986) introduced arbitrary anchored values to influence self-efficacy judgments. Arbitrary high starting points heightened students' perceived self-efficacy, while arbitrary low starting points lowered students' perceived self-efficacy. Students with higher perceived self-efficacy persevered longer on difficult and unsolvable problems before quitting than students with lower perceived self-efficacy. Similar results were found in Peake and Cervone's (1989) related study on anchoring influence in which self-efficacy beliefs were manipulated by having people evaluate their self-efficacy in relation to ascending or descending levels of possible attainment. Elevated self-efficacy beliefs increased effort, while lowered self-efficacy beliefs decreased effort on difficult problems. In a subsequent study, Cervone (1989) used differential cognitive focus related to a task to manipulate self-efficacy judgments. He found that dwelling on troublesome aspects of the task weakened self-efficacy beliefs, whereas focusing on attainable aspects raised self-efficacy judgments. Once again, higher levels of self-efficacy were linked to stronger perseverance in the face of repeated failures. The importance of perceived self-efficacy as a causal factor in motivation is highlighted in these various studies as perceived self-efficacy was shown to predict variance in motivation across treatment conditions as well as within treatments. Neither

anchoring influence (e.g., Cervone & Peake, 1986; Peake & Cervone, 1989) nor cognitive focus (e.g., Cervone, 1989) had any impact on motivation when variations in self-efficacy beliefs were accounted for. The effects of anchoring and cognitive focus influences on motivation were fully mediated by changes in self-efficacy beliefs.

Bandura and Cervone (1986) investigated the relationship between perceived self-efficacy for goal attainments at various set levels of discrepancy (-26%, -14%, -4%, and +4%). Participants reported their perceived self-efficacy for goal attainments using an efficacy scale that described fifteen possible levels of attainments relative to the baseline level. The goal attainments changed in 10% intervals from a 30% decrement to a 110% increase above the baseline level. For each of the 15 possible levels, participants rated the strength of their perceived self-efficacy that they could achieve them on a 100-point scale, ranging in 10-unit intervals from high uncertainty to complete certitude. As found in a previous study (Bandura & Cervone, 1983), perceived self-efficacy for the original goal of a 50% increase was the most predictive of how much effort participants enlisted in the activity. This original perceived self-efficacy measure was consequently the one used in Bandura and Cervone's (1986) analyses. Similarly, the present study used perceived self-efficacy toward the original goal.

Bandura and Cervone (1986) reported that as the performance-goal discrepancy narrowed and ultimately became positive, the strength of the perceived self-efficacy toward the original goal increased. On the 100-point scale, participants reported perceived self-efficacy means of 37.00 (*SD* = 33.10), 48.00 (*SD* = 30.88), 48.50 (*SD* = 34.22) and 60.50 (*SD* = 36.49) for the large substandard condition, moderate substandard condition, small substandard condition and small suprastandard condition respectively.

Based on these above findings, it was expected that in the proposed model, the magnitude of the negative performance-goal discrepancies would have a direct negative effect on student perceived self-efficacy toward the original goal. Students further from their pre-set goal were therefore expected to report lower level of self-efficacy than students closer to their goal.

Hypothesis 3: The magnitude of the negative performance-goal discrepancies will have a direct negative effect on perceived self-efficacy toward the original goal.

In addition to showing that perceived self-efficacy was highly influenced by the performance-goal discrepancy condition, Bandura and Cervone (1986) showed that the patterns of perceived self-efficacy toward the original goal varied as a function of discrepancy conditions. For the large substandard performance-goal discrepancy condition, the majority of participants (65%) reported weak self-efficacy strength. About ten percent of them expressed moderate self-efficacy strength while the remaining 25% reported high strength. For the moderate substandard condition, most participants expressed weak (40%) or moderate (40%) strength while the remaining 20% reported high strength. For the small substandard condition, 40% participants reported weak strength while 45% reported high strength. The remaining 15% reported moderate self-efficacy strength. For the small suprastandard condition, half of the participant rated their self-efficacy high while the other half was split between moderate (25%) and weak self-efficacy (25%). A χ^2 test showed that these variable patterns of perceived self-efficacy were significant ($\chi^2(6) = 12.26$, $p = .056$). The present study aimed at explaining some variance in self-efficacy by considering the influence of achievement goals on self-efficacy. Stated differently, the present study posits that achievement goals might, in

part, explain the reason with self-efficacy measures differ among individuals. Achievement theory will be examined later on in this chapter.

Although Bandura and Cervone (1986) noticed that change in discrepancy conditions lead to substantially different patterns of perceived self-efficacy, self-efficacy was linked to higher effort output. Except for small negative performance-goal discrepancy (-4%), perceived self-efficacy to attain the original goal contributed significantly to motivation, regardless of the direction and magnitude of the performance-goal discrepancy. The more self-efficacious participants perceived themselves to be, the more they increased their effort. Perceived self-efficacy for the original goal attainment explained 24% ($r = .69$, $F = 8.86$, $p < .01$), 19% ($r = .57$, $F = 6.68$, $p < .025$) and 20% ($r = .52$, $F = 5.55$, $p < .05$) of the variance in effort change in the case of large substandard discrepancies (-26% below goal), moderate substandard discrepancies (-14%), and small suprastandard discrepancies (+4%) respectively. For the present study, it was hypothesized that in the case of negative performance-goal discrepancies, students' perceived self-efficacy toward the original goal would exert a direct positive effect on intended effort after controlling for the magnitude of the performance-goal discrepancy and future affective self-evaluation.

Hypothesis 4: Perceived self-efficacy toward the original goal will have a direct positive effect on intended effort.

Self-set goals. The third self-reactive influence, self-set goals, concerns the goals students set for themselves in response to performance feedback. As proximal goals were found to be better motivators than distal goals (Bandura & Schunk, 1981), the current study focused on students' proximal goals rather than distal goals. Campion and Lord

(1982) showed that the goals people set for themselves at the beginning of a task were likely to change based on the pattern and level of progress they were making. Thus, following performance feedback regarding their most recent past goal, students could raise, lower or maintain their goal level for the next proximal goal. Consider for instance a student who had the goal of achieving a 95 (an A) on his first exam and who obtained a 81 (B-) on it. This student might (a) raise his goal level for his next exam and aim for a grade above 95 (maybe in order to make up for his subpar performance on his first exam); (b) lower his goal for his next exam and aim for a grade below 95 (maybe the student now feels that a grade of 95 is no longer achievable); or (c) maintain his goal level and continue to aim for a 95.

The role of performance feedback in influencing self-set goals has generated a large body of literature, but findings have often been inconsistent or contradictory. Kluger and DeNisi (1996) noted that "without a comprehensive theory, there is no way to integrate the vast and inconsistent empirical findings" (p. 277). Some researchers argue that the more negative the feedback is, the more likely the feedback recipient is to adjust his or her goal downward (e.g., Bandura & Cervone, 1986; Donovan & Williams, 2003; Ilies & Judge, 2005; Williams et al., 2000). Others argue that the more negative the feedback is, the more likely the feedback recipient is to adjust his or her goal upward (e.g., Carver & Scheier, 1981, 1998, 2000).

In Bandura and Cervone's study (1986), the means of reported self-set goals decreased as the magnitude of negative performance-discrepancy increased. Using a free response form, participants reported their self-set goals as percentage change in effort. They recorded self-set goal means of 47.00 (*SD* = 19.96), 41.40 (*SD* = 24.23) and 36.10

(*SD* = 16.80) for the small substandard condition, moderate substandard condition, and large substandard condition, respectively. However, as in the case of perceived self-efficacy, the patterns of self-set goals in Bandura and Cervone's (1986) study varied as a function of discrepancy conditions. For the large substandard condition, half of the participants lowered their subsequent self-set goal while the other half maintained their original goal of a 50% gain. For the moderate substandard condition, half of the participants lowered their goal, while 35% kept the same original goal and 15% increased their goals. For the small substandard condition, 45% of participants elected to maintain their goal while 30% increased their goals and 25% lowered their goals. Lastly, for the small suprastandard condition, half of the participants increased their goals while 35% lowered them and 15% kept the same goals. The χ^2 test showed that the differences in self-set goals patterns were significant ($\chi^2(6) = 17.74$, $p < .01$). Similarly than for perceived self-efficacy, Bandura and Cervone's (1986) did not intend to explain these differential patterns. On the contrary, the present study intended to explain some of these differences with achievement goals.

Several more recent studies produced results congruent with Bandura and Cervone's (1986) study. In their longitudinal study of goal and performance regulation in 25 track and field athletes, Williams et al. (2000) for instance, found evidence of downward goal revision following negative feedback. In a similar study with college track and field athletes, Donovan and Williams (2003) found that their participants were more likely to lower their goals when they failed to achieve their goals and when the magnitude of the performance-goal discrepancy was large. More recently, Ilies and

Judge (2005) found that their participants lowered their goals following negative feedback related to organizational tasks.

The studies mentioned in the previous paragraphs (e.g., Bandura & Cervone, 1986; Donovan & Williams, 2003; Ilies & Judge, 2005; Williams et al., 2000) provided evidence that following negative performance-goal feedback, individuals would adjust their goals downward and in proportion to the magnitude of the performance-goal discrepancy. It is however important to note that none of these studies have been conducted in an educational setting. The focal task in most studies was physical in nature (e.g., Bandura & Cervone, 1986; Donovan & Williams, 2003; Williams et al., 2000) or set in an organizational setting (e.g., Ilies & Judge, 2005). Thus, as mentioned previously, results from these studies may not generalize to tasks performed in educational settings.

Casting additional doubts on the generalizability of such studies is the fact that not all researchers agree that negative feedback usually lead to a downward adjustment of goals. For example, Carver and Scheier (1981, 1998, 2000) in their adaptation of the feedback-loop theory of self-regulation, argue that following a control mechanism in which "goals serve as reference values for feedback loops" (2000, p. 42), unmet goals should lead to increased motivation and higher future goals. They argue that when individuals failed to achieve their pre-set standard, they increase their subsequent goal to more closely approach their standard. In an educational context, this suggests that following a negative performance feedback, students would set higher proximal goals for themselves for subsequent tests in hope to more closely approach their initial overall course grade goal.

In light of the inconsistent and contradictory findings in the literature regarding the influence of performance feedback on goals and the lack of studies conducted in educational settings, the present study did not hypothesize any direct effect of the magnitude of the negative performance-goal discrepancy on proximal goal. That is, the present study will be exploratory in nature when it comes to the relationship between the negative performance-goal discrepancy and proximal goal. It was however expected that achievement goals would explain some of the individual differences in goals observed by Bandura and Cervone (1986). The hypothesized direct effects of achievement goals on proximal goal will be discussed in further details later in the literature review.

Even though there is a lack of consensus in the literature considering the determination of what kind of self-set goal will occur in response to performance feedback, most theorists agree that goal difficulty raises effort level. However, the nature of the relationship between goals and effort has been debated. Expectancy-value theorists (e.g., Atkinson, 1964: Feather, 1982) predict a curvilinear relationship between goal difficulty and effort with effort being highest for moderately difficult goals. Goal theorists (e.g., Latham & Locke, 2006; Locke, 1968; Locke, Frederick, Lee, & Bobko, 1984; Locke & Latham, 2002; Tubbs, 1986; Wood et al., 1987), on the other hand, postulate an increasing linear relationship between goal level and effort. In the goal theory conception, the linear relationship is assumed to hold true only if people accept the goals and are committed to them. Thus, as long as goals appear reachable, goal theorists predict that people continue to set challenging standards that foster performance motivation. Because the current study focused on goals set by students rather than on goals assigned to students, it was assumed that students would accept their goals and that

they would be committed to them (Kiesler, 1971; Langer, 1975). Thus, the linear relationship advanced by goal theorists should hold true for the proposed model.

The positive linear relationship was supported by Bandura and Cervone (1986) at each of their discrepancy levels (-14%, -4%, +4%) except for the large negative discrepancy treatment (-26%). Self-set goals explained 17% ($r = .69$, $F = 6.03$, $p < .05$), 66% ($r = .84$, $F = 35.55$, $p < .001$) and 16% ($r = .59$, $F = 4.54$, $p < .05$) of the variance in effort change in the case of moderate substandard discrepancies (-14% below goal), small substandard discrepancies (-4%), and small suprastandard discrepancies (+4%) respectively. Bandura and Cervone attributed this lack of significant relationship in the large substandard condition to the fact that self-set goals spanned over a range too small to allow for the emergence of a relationship. For the proposed model, it was hypothesized that proximal goal will exert a direct positive effect on intended effort after controlling for the magnitude of the performance-goal discrepancy, future affective self-evaluation and self-efficacy toward the original goal.

Hypothesis 5: Proximal goal will have a direct positive effect on intended effort.

Links between self-reactive influences. Bandura and Cervone (1986) presented the zero-order correlations among the three self-reactive influences for each of the four discrepancy levels. However, no study has modeled the relationships between the three self-reactive influences, let alone controlled for varying levels of discrepancies. In the model developed for the current study, future affective self-evaluation was entered as the first self-reactive influence because personal investment of self-evaluative significance in a task contributes some incentive to exercise one's capabilities (Bandura & Cervone, 1986). Perceived self-efficacy toward the original goal was entered as the second self-

reactive influence as it was expected to influence the levels at which proximal goals are set. Proximal self-set goal was therefore entered as the last self-reactive influence.

The current study hypothesized a direct positive effect of future affective self-evaluation on perceived self-efficacy toward the original goal in the case of negative performance-goal discrepancies. Following a negative performance feedback, the more satisfied students would be if they were to achieve the same substandard performance on their next exam, the more self-efficacious they were expected to be. This hypothesis seems at first contradictory to Bandura and Cervone's (1986) results that showed that the more self-dissatisfied the participants were with large ($r = .49$, $p < .025$) or moderate ($r = .39$, $p < .05$) substandard attainments, the stronger their self-efficacy for the original goal attainment. However, Bandura and Cervone (1986) measured the self-reactive influences under three substandard conditions (large, moderate, and small) with each having a set level of discrepancy (-26%, -14%, or -4% respectively). In these controlled environments, for any given set of discrepancy level, it seems logical that students who forecasted lower level of satisfaction were the ones who were the most confident that they would not repeat such a substandard performance (i.e., higher self-efficacy). In the present study, however, the magnitude of the discrepancy was not manipulated to create various discrepancy level conditions. It was allowed to vary to reflect the students' actual performance-goal discrepancies. In the current study model, student future affective self-evaluation was expected to be highly influenced by the magnitude of the discrepancy. That is, higher levels of future affective self-evaluation were expected to be reported by students who barely failed to achieve their goal (i.e., smaller negative performance-goal discrepancies) compared to students who failed to achieve their goal by

a larger margin (i.e., greater negative performance-goal discrepancies). Such students were therefore expected to be more confident that they could still achieve their original goal for the course set at the beginning of the semester (i.e. higher level of self-efficacy toward original goal). Thus, in the current study, future affective self-evaluation was expected to exert a direct positive effect on perceived self-efficacy toward the original goal.

Hypothesis 6: Future affective self-evaluation will have a direct positive effect on perceived self-efficacy toward the original goal.

Several studies have demonstrated that students with higher self-efficacy set higher goals (Bandura & Schunk, 1981; Locke et al., 1984; Taylor, Locke, Lee, & Gist, 1984; Zimmerman et al., 1992). However these studies did not address this relationship within the performance-goal discrepancy paradigm. The current study hypothesized that the positive correlation between perceived self-efficacy and goal would hold true for negative performance-goal discrepancies in which students are striving to attain their goal. This hypothesis is aligned with Bandura and Cervone's (1986) study which highlighted significant positive correlations between self-efficacy and self-set-goals for both the large ($r = .54$, $p < .01$) and moderate ($r = .47$, $p < .025$) substandard conditions.

Hypothesis 7: Perceived self-efficacy toward the original goal will have a direct positive effect on proximal goal.

Based on hypothesis 6 and 7, the present study expected to uncover a significant indirect effect of future affective self-evaluation on proximal goal through the mediating variable, self-efficacy. However, no significant direct effect was expected to be found between future affective self-evaluation and proximal goal. Similarly to hypothesis 6,

this hypothesis seems to be contradicting Bandura and Cervone's (1986) study which reported significant positive correlations between self-dissatisfaction and self-set-goals for both the large ($r = .71$, $p < .001$) and moderate ($r = .52$, $p < .025$) substandard conditions. However, as previously mentioned, results from Bandura and Cervone's (1986) study which focused on self-reactive influences at specific performance-goal discrepancy conditions cannot be expected to be replicated by the present study which proposed a model that takes into account varying levels of discrepancies.

Hypothesis 8: Future affective self-evaluation will not exert a direct effect on proximal goal.

The above sections presented a review of the cognitive motivation literature. The roles of each of the three self-reactive influences in cognitive motivation were highlighted. In addition, the links between all three self-reactive influences were explored. The following sections will address achievement goal theory. Specifically, the links between achievement goals and self-reactive influences and between achievement goals and effort will be examined.

Achievement Goal Theory

Achievement goal orientation theory distinguishes the different types of achievement goals and offers a perspective for understanding student motivation and behavior in an academic achievement setting. By focusing on the relationship between ability beliefs and motivation, it not only describes the purpose for engaging in particular behaviors (Anderman, Austin, & Johnson, 2002), but also explains how students evaluate their own competence in achievement situations and how they decide to participate in and handle such situations (Pintrich & Schunk, 2002). Ames (1992) defined goal orientation

as an integrated pattern of beliefs that leads to "different ways of approaching, engaging in, and responding to achievement situations" (p. 261). Similarly, Middleton and Midgley (1997) defined achievement goal orientation as a framework through which individuals interpret and react to an event, generating "different patterns of affect, cognition, and behavior" (p. 710). Pintrich (2000a) adds that "current achievement goal constructs address the issue of the purpose or reason students are pursuing an achievement task as well as the standards or criteria they construct to evaluate their competence or success on the task" (p. 94). As such, this study postulates that achievement goals have an effect on self-reactive influences.

Within the last 25 years, the study of students' achievement goals has emerged as an important framework for understanding motivation in educational settings (Midgley et al., 1998; Pintrich & Schunk, 1996). However, because numerous models of goal orientation have been advanced over the years, it is difficult to integrate findings to form a comprehensive view of the impact of achievement goals on self-reactive influences. Before addressing the role of the four types of achievement goals derived from the 2 × 2 goal achievement goal orientation framework on self-reactive influences, it is important to understand how the goal orientation construct evolved through the years. This knowledge is crucial in order to understand the challenges researchers face when trying to derive conclusions from the goal orientation literature. The next section presents an overview of the evolution of the goal orientation construct over the last two decades.

Evolution of the Goal Orientation Construct

When the first achievement goal models were introduced, goal orientations were divided into two basic kinds of achievement goals. In Dweck's model, the two goal orientations were called *learning* and *performance* goals. Learning goals referred to a focus on increasing competence, whereas performance goals involved either the gain of favorable judgments of competence or the avoidance of negative judgments of competence (Dweck, 1986; Dweck & Leggett, 1988). Dweck (1992) described the two contrasting achievement goal orientations as "seeking to prove one's competence versus seeking to improve one's competence." (p. 165). In this initial conception of goal orientations (e.g., Diener & Dweck, 1978; Dweck & Leggett, 1988), individuals were either learning-oriented, performance-oriented, or somewhere in the middle of these two dimensions as a matter of temperament. In Ames' conception, the two goal orientations were labeled as *mastery* and *performance* goals. Mastery goals oriented individuals to develop new skills, to try to understand a task, to improve their level of competence, or to achieve a sense of mastery based on self-referenced standards (Ames, 1992). These self-referenced standards used to evaluate one's competence could either be absolute (i.e., meeting requirements of a task) or intrapersonal (i.e., individual's past achievement or maximum potential). Performance goals on the other hand, oriented individuals to focus on their ability and self-worth. Such individuals determined their competence based on the use of normative or interpersonal standards (i.e., others' performance) as well as public recognition (Ames, 1992).

While Dweck and Ames' models were the most prominent models used in early research examining the dichotomous distinction of goal orientations, other alternative conceptualizations were also proposed. For instance, Midgley and his colleagues (e.g.,

Anderman & Midgley, 1997; Kaplan & Midgley, 1997; Maehr & Midgley, 1991, 1996; Middleton & Midgley, 1997; Midgley, Arunkumar, & Urdan, 1996; Midgley et al., 1998) used the term *task* goals and *performance* goals. Task goals closely resembled Dweck's learning goals and Ames' mastery goals. Midgley and colleagues' performance goals paralleled Dweck's and Ames' performance goals. Nicholls and his colleagues (e.g., Nicholls, 1984; Nicholls, Patashnick, & Nolen, 1985; Thorkildsen & Nicholls, 1988) used a slightly different approach to delineate their two different goals: *task-involved* and *ego-involved* goals. Instead of focusing on the general purposes that learners might have when approaching or performing a task, their conception of achievement goals focused on the conditions that make individuals feel most successful. Task-involved goals are defined as experiencing success when individuals learn something new, gain new skills or knowledge, or do their best. Ego-involved goals are defined as achieving success when individuals outperform their peers or avoid looking incompetent.

Although the terms and definitions used to describe the two main goal orientation types differed among theorists, there was a general consensus that each of these goal orientations were linked to different patterns of affective, behavioral, and cognitive outcomes (Ames, 1992; Dweck, 1999; Urdan; 1997). While mastery/learning orientation was considered as an adaptive orientation, the performance orientation was considered to be a maladaptive orientation. Mastery/learning orientation was seen as the most favorable goal orientation to have because of its link to several positive behavior outcomes. For example, mastery orientation was found to promote intrinsic motivation and foster long-term learning (Ames, 1992). More specifically, mastery/learning orientation, as opposed to performance orientation, has been linked to higher levels of

cognitive engagement with the task (Ames, 1992; Meece et al., 1988), better problem-solving strategies (Elliot & Dweck, 1988), higher self-efficacy (Wolters et al., 1996), more difficult tasks (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988), less self-handicapping strategies (Midgley & Urdan, 2001), greater perseverance in the face of setbacks (Ames, 1992; Dweck, 1986; Dweck & Leggett, 1988; Elliot & Dweck, 1988), more help-seeking behaviors (Butler & Neuman, 1995) and less helpless patterns (Dweck, 1986).

On the other hand, performance orientation, as opposed to mastery orientation, was initially considered as a maladaptive goal because of its association to negative, less adaptive behaviors and outcomes. Performance orientation, for example, has been associated with higher levels of anxiety, temptation to cheat or to engage in shallow rote-learning (Ames, 1992) as well as avoidance of challenge and negative affect (Dweck, 1986; Dweck & Leggett, 1988, Elliot & Dweck, 1988). Further, students with a performance orientation are more extrinsically motivated and therefore focus less on learning and more on achieving high grades (Elliot, 1999).

As research progressed over the years, the initial conception of goal orientation as a dichotomous framework was challenged. In particular, Elliot and his colleagues questioned the characterization of mastery goals as adaptive and performance goals as maladaptive (Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996). They remarked that although mastery goals had consistently been associated with positive outcomes, performance goals had been linked to not only negative, but also positive outcomes (Refer to Midgley, Kaplan, & Middleton (2001) for an overview of studies that indicate the positive outcomes associated with performance goals). For example, several

studies linked performance goals to positive outcomes such as positive self-concept, affect, attitudes, and valuing of academic work (Midgley et al., 1996; Nicholls et al., 1985; Pajares, Britner, & Valiante, 2000; Pintrich & Garcia, 1991; Roeser, Midgley, & Urdan, 1996; Skaalvik, 1997; Wolters et al., 1996), and effort (Bouffard, Boisvert, Vezeau, & Larouche, 1995; Elliot & McGregor, 1999; Elliot, McGregor, & Gable, 1999). Further, performance goals have also been positively associated with variables known to promote academic achievement such as course grades, test scores and academic self-efficacy (Bouffard et al., 1995; Church, Elliot, & Gable, 2000; Elliot & Church, 1997; Elliot & McGregor, 1999; Elliot et al., 1999; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Kaplan & Maehr, 1999; Midgley, Anderman, & Hicks, 1995; Midgley & Urdan, 1995; Pintrich & Garcia, 1991; Roeser et al., 1996; Skaalvik, 1997; Wolters et al., 1996).

In order to explain the reasons why performance goals had been linked to both positive and negative outcomes, Elliot and his colleagues suggested that two types of performance goals could be distinguished (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). They based this new conceptualization on Dweck's beliefs that not all goals were directed toward approaching a desirable outcome (e.g. good grades) and that goals could also be directed toward avoiding an undesirable outcome (e.g. getting a bad grade) (Dweck, 1986; Dweck & Bempechat, 1983). Elliot and colleagues (Elliot, 1997; 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996) as well as others (e.g., Middleton & Midgley, 1997) therefore introduced a trichotomous goal orientation framework by making a distinction between approach and avoidance motivation within performance goals. Individuals focusing on getting positive judgment from others were considered to

have a performance-approach orientation while individuals focusing on avoiding negative judgment were categorized under the performance-avoidance orientation. This trichotomous goal orientation framework was subsequently supported by factor analyses studies and studies linking each type of performance goals to various positive and negative outcomes. These studies highlighted the performance-approach orientation as being more adaptive than the performance-avoidance orientation (e.g., Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot et al., 1999; Middleton & Midgley, 1997; Midgley et al., 1998). In a related line of research, Skaalvik and his colleagues (Skaalvik, 1997; Skaalvik, Valas, & Sletta, 1994) have also examined two dimensions of performance goals: *self-enhancing ego orientation* which parallels the performance-approach orientation and, *self-defeating ego orientation* which parallels the performance-avoidance orientation.

More recently, Elliot and McGregor (2001) tested and supported a 2 × 2 achievement goal framework previously suggested by Elliot (1999) and Pintrich (2000b). This four-factor framework not only makes the valence distinction between approach and avoidance motivation within performance goals, but also within mastery goals. This new conceptualization also uses Ames (1992) definitions of competence (absolute or intrapersonal vs. normative or interpersonal). Under this new framework, performance-approach and performance-avoidance goals are both adopted by students who focus on demonstrating their academic competence relative to their peers and who evaluate their competence using normative or interpersonal standards. However, students with performance-approach goals seek to perform better than their peers, whereas students with performance-avoidance goals try to avoid performing worse than their peers.

Similarly, mastery-approach and mastery-avoidance goals apply to students who are concerned with improving their academic competence and who evaluate their competence using absolute or intrapersonal standards. However, students with mastery-approach goals strive to improve their competence, whereas students with mastery-avoidance goals focus on the avoidance of task-based incompetence.

Elliot and McGregor (2001) developed the Achievement Goal Questionnaire (AGQ) to empirically assess students' achievement goals within a course-specific context according to this 2 × 2 achievement goal framework. Using a U.S. sample, they compared the 2 × 2 framework to the previous dichotomous and trichotomous frameworks and concluded that the new framework provided a better fit. Murayama, Zhou, and Nesbit (2009) subsequently provided strong evidence for the 2 × 2 framework of achievement goals in both the Canadian and Japanese populations. Since then, the original AGQ items have been revised to address several specific problems with the measurement of achievement goals in the literature (Elliot & Murayama, 2008). The structural validity and predictive utility of the revised AGQ (AGQ-R) was recently demonstrated (Elliot & Murayama, 2008). In 2004, Finney, Pieper, and Barron provided construct validity evidence for the use of the 2 × 2 framework within a general academic context. They modified the original AGQ items to measure achievement goals within a general academic context instead of the original course-specific context (AGQ-M, Finney, et al., 2004). In addition to providing additional evidence of construct validity for the AGQ-M, Campbell, Barry, Joe, and Finney (2008) also offered support for the equivalence of functioning of the AGQ-M across African American and White university students.

A 3 × 2 achievement goal framework has recently been proposed and tested (Elliot et al., 2011). This new model, based on the definition and valence components of competence, includes six achievement goals: task-approach, task-avoidance, self-approach, self-avoidance, other-approach, and other-avoidance. Although, Elliot et al. (2011) showed that this new framework does have promise, the 2 × 2 achievement goal framework remains the most predominant theory to date. As such, the 2 × 2 achievement goal framework with its four achievement goal types was the framework used in the current study.

Achievement Goals and Cognitive Motivation

Most models of goal orientation described in the previous paragraphs have been used to link achievement goals to various aspects of motivation (e.g., efficacy, value, interest, attribution, affect). However, the differences between models make integration of the findings difficult. The fact that researchers use various theoretical perspectives, terminology and measurement instruments to address achievement goals adds to the confusion. Specifically, because most empirical research involving achievement goals have used the original dichotomous goal orientation framework which only considers one type of mastery goals, mastery-approach goals, and did not discriminate between performance-approach and performance-avoidance goals, little is known about the influence of mastery-avoidance goals and differences between the two types of performance goals.

The present study hypothesized that the four achievement goals, as conceptualized in the 2 × 2 achievement goal framework, mostly influence cognitive motivation (i.e., intended effort) through the mediating self-reactive influences. It is

expected that the pursuit of these distinct goal types is likely to alter the way students evaluate and interpret the discrepancy between their performance and pre-set goal (i.e., the future affective self-evaluation and perceived self-efficacy) as well as the way they subsequently respond to such performance-goal discrepancies (i.e., self-set goals and intended effort). The next sections will discuss what is known about the influences of the different types of achievement goals on the three self-reactive influences and intended effort.

Mastery goals. As most models of achievement goals have addressed mastery-approach goals in their empirical research, the general positive motivational influence of mastery-approach goals have been amply documented. However, because most studies did not address mastery-avoidance goals, the influence of such goals on self-reactive influences and intended effort has not yet been explored. The present study was therefore exploratory in nature when it came to the role of mastery-avoidance goals on cognitive motivation.

A review of the achievement goal orientation literature shows that individuals who have a mastery goal orientation are willing to put forth more effort toward mastering a skill than individuals who have a performance goal orientation (e.g., Ames, 1992; Dweck, 1986; Elliot & Dweck, 1988; Meece et al., 1988). Therefore, the present study hypothesized that mastery-approach goals would exert a positive direct effect on intended effort in the case of negative performance-goal discrepancies.

Hypothesis 9: Mastery-approach goals will have a positive direct effect on intended effort.

Research also shows that students who adopt mastery goals are more likely to make adaptive attributions for their performance. They are more prone to believe that effort will lead to success, that effort does not necessarily mean low ability, that effort is a strategy for activating their ability for mastery, and that failure can be attributed to low effort or poor strategies (Ames, 1992: Dweck & Leggett, 1988; Nicholls, 1984; Pintrich & Schunk, 1996). Following the general findings of the attributional literature (Weiner, 1986), students who attribute their failure to low effort or bad strategies will not automatically lower their self-efficacy beliefs (Weiner, 1986). These predictions were corroborated in both laboratory (Dweck & Leggett, 1988) and classroom settings (e.g., Ames, 1992; Kaplan & Midgley, 1997; Middleton & Midgley, 1997; Wolters et al., 1996). Students with mastery goals who were focused on learning and improving their mastery of a task were found to be more likely to interpret performance feedback in terms of the progress they had made, therefore supporting their efficacy beliefs.

It is important to note that all of the above research on mastery goals has only investigated mastery-approach goals, not mastery-avoidance goals. Hence, the only hypothesis that could be drawn from the above research concerned the relationship between mastery-approach goals and self-efficacy beliefs. Specifically, the current study hypothesized that the influence of mastery-approach goals on self-efficacy would be two-fold. First, mastery-approach goals were expected to have a positive main effect on self-efficacy. Second, mastery-approach goals were expected to moderate the relationship between the performance-goal discrepancy and self-efficacy. Students with high mastery-approach goals compared to students with low mastery-approach goals were therefore not only expected to report higher levels of self-efficacy (i.e., main effect), but

were also expected to have their self-efficacy not as affected by the negative performance-goal discrepancy (i.e., moderating effect).

Hypothesis 10: Mastery-approach goals will have a direct positive effect on perceived self-efficacy toward the original goal.

Hypothesis 11: Mastery-approach goals will moderate the relationship between the negative performance-goal discrepancy and perceived self-efficacy toward the original goal.

No specific studies analyzed the influence of mastery goals on future affective self-evaluation. However, there was no reason to expect that students with higher levels of mastery goals would report higher or lower levels of future affective self-evaluation. Thus, it was hypothesized that mastery goals would not exert a direct effect on future affective self-evaluation.

Hypothesis 12: Mastery-approach goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 13: Mastery-avoidance goals will not have a significant direct effect on future affective self-evaluation.

Similarly, the sense of satisfaction with performance and proximal goals of students with high mastery goals should not be significantly influenced by external indicators such as performance feedback. Therefore mastery goals (both mastery-approach and mastery-avoidance goals) were not expected to moderate the relationship between the negative performance-goal discrepancy and the two self-reactive influences.

Hypothesis 14: Mastery-approach goals will not moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 15: Mastery-approach goals will not moderate the relationship between the negative performance-goal discrepancy and proximal goal.

Hypothesis 16: Mastery-avoidance goals will not moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 17: Mastery-avoidance goals will not moderate the relationship between the negative performance-goal discrepancy and proximal goal.

Even though mastery goals were not expected to moderate the relationship between the performance-goal discrepancy and proximal goal, mastery goals were hypothesized to exert a positive main effect on proximal goal. That is, it seemed logical that students with higher mastery goals would set higher goals for themselves in order to either learn as much as possible (i.e., students with mastery-approach goals) or to avoid not learning as much as possible (i.e., students with mastery-avoidance goals).

Hypothesis 18: Mastery-approach goals will have a significant direct positive effect on proximal goal.

Hypothesis 19: Mastery-avoidance goals will have a significant direct positive effect on proximal goal.

Performance goals. The research on performance goals and motivational phenomena is not as straightforward as the results for mastery goals. The original achievement goal theory research (e.g., Ames, 1992; Dweck & Leggett, 1988; Pintrich &

Schunk, 1996) generally found negative effects between performance goals and various motivational outcomes. However, these results need to be interpreted with caution because most studies did not empirically discriminate between performance-approach and performance-avoidance goals. The more recent research that has made that distinction (e.g., Harackiewicz, Barron, & Elliot, 1998) suggests that there could be some positive aspects of performance-approach goals.

Although no study specifically addresses the role of performance goals on future affective self-evaluation, it seems logical to expect that students with high performance goals who have a more extrinsic approach to learning (Elliot, 1999), will have their sense of satisfaction highly influenced by external performance indicators such as grades. Thus, both performance-approach and performance-avoidance goals were expected to moderate the relationship between the performance-goal discrepancy and future affective self-evaluation. Students with high performance-approach goals as well as students with high performance-avoidance goals were expected to have their future affective self-evaluation more influenced by negative performance feedback. Performance-approach and performance-avoidance goals were however not expected to exert any direct effect on future affective self-evaluation.

Hypothesis 20: Performance-approach goals will moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 21: Performance-avoidance goals will moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 22: Performance-approach goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 23: Performance-avoidance goals will not have a significant direct effect on future affective self-evaluation.

Regarding the linear relationships between performance-approach goals and self-efficacy, correlational studies have produced some inconsistent findings. Anderman and Midgley (1997) showed that performance-approach goals were positively related to self-efficacy beliefs for sixth graders. Wolters et al. (1996) and Skaalvik (1997) found similar results for junior high students. Pajares et al. (2000) also came to the same conclusions in the areas of middle school writing. However, Anderman and Midgley (1997) did not find a link between performance-approach goals and self-efficacy beliefs for fifth graders. Similarly, Middleton and Midgley (1997) found that performance-approach goals were unrelated to self-efficacy for sixth-grade students. The current study tested these relationships for undergraduate college students. No relationship between performance-approach and self-efficacy was hypothesized due to the conflicting findings in the literature. In essence, the current study was exploratory in nature when it came to the relationship between performance-approach goals and self-efficacy toward initial goal.

In regards to performance-avoidance goals, findings have been more consistent. Middleton and Midley (1997), Skaalvik (1997) as well as Pajares et al. (2000) found that performance-avoidance goals were negatively related to self-efficacy. Thus, in the present study, it was hypothesized that performance-approach goals would exert a negative effect on self-efficacy.

Hypothesis 24: Performance-avoidance goals will have a significant direct negative effect on the perceived self-efficacy toward original goal.

The relationships between performance goals and self-set goal is complicated by the fact that in Dweck's original model (Dweck & Leggett, 1988), the links between performance goals and other motivational outcomes were assumed to be moderated by self-efficacy beliefs. That is, performance goals were assumed to have detrimental effects on goals only when self-efficacy was low. For example, students with performance goals and high efficacy beliefs were assumed to adopt higher goals than students with performance goals and low self-efficacy beliefs. Some correlational studies that did not explicitly test for the interaction between performance goals and self-efficacy found some significant linear relationship between performance goals and goal adjustment. For instance, Donovan and Swander (2001) and Donovan and Williams (2003) found that individuals with strong performance goal orientation engaged in greater goal revision than those with a weaker performance goal orientation. Based on these findings, the present study (which did not test for a possible interaction between performance goals and self-efficacy) hypothesized that performance goals (both performance-approach and performance-avoidance) would exert a direct positive effect on proximal goal in the case of negative performance-goal discrepancies.

Hypothesis 25: Performance-approach goals will have a significant direct positive effect on proximal goal.

Hypothesis 26: Performance-avoidance goals will have a significant direct positive effect on proximal goal.

Summary of the Hypotheses and Hypothesized Model

The proposed model used in the current study consists of three overarching conceptual components. The first component addresses the mediating role of the self-reactive influences in cognitive motivation based on goal intention. The second component addresses the links between the self-reactive influences. The third component expands on this conceptualization by adding student achievement goals as antecedents to self-reactive influences and intended effort. The following paragraphs summarize the hypotheses presented in the previous sections as they relates to each of the three overarching components. Figure 2 presents the hypothesized model.

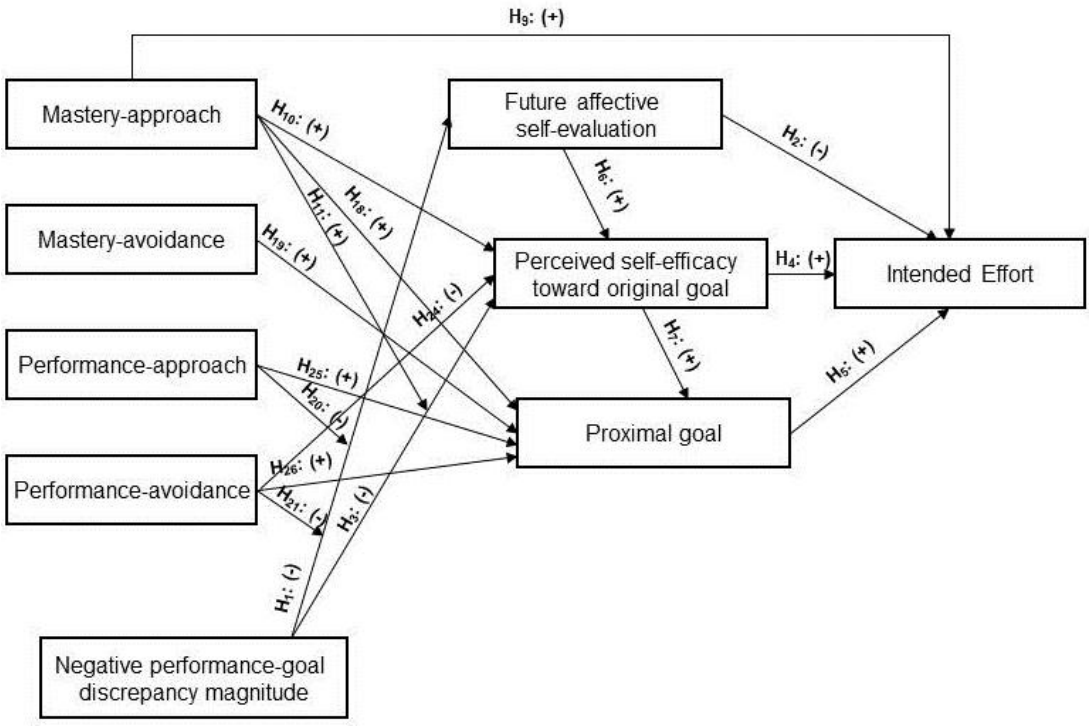

Figure 2. Hypothesized model. Note. Only the expected significant relationships are illustrated in the figure. Expected non-significant relationships are omitted in order to simplify the figure.

The Mediating Role of Self-Reactive Influences in Cognitive Motivation

Hypothesis 1: The magnitude of the negative performance-goal discrepancies will have a direct negative effect on future affective self-evaluation.

Hypothesis 2: Future affective self-evaluation will have a direct negative effect on intended effort.

Hypothesis 3: The magnitude of the negative performance-goal discrepancies will have a direct negative effect on perceived self-efficacy toward the original goal.

Hypothesis 4: Perceived self-efficacy toward the original goal will have a direct positive effect on intended effort.

Hypothesis 5: Proximal goal will have a direct positive effect on intended effort.

Links between Self-Reactive Influences

Hypothesis 6: Future affective self-evaluation will have a direct positive effect on perceived self-efficacy toward the original goal.

Hypothesis 7: Perceived self-efficacy toward the original goal will have a direct positive effect on proximal goal.

Hypothesis 8: Future affective self-evaluation will not exert a direct effect on proximal goal.

Achievement Goals as Antecedents to Self-Reactive Influences and Intended Effort

Hypothesis 9: Mastery-approach goals will have a positive direct effect on intended effort.

Hypothesis 10: Mastery-approach goals will have a direct positive effect on perceived self-efficacy toward the original goal.

Hypothesis 11: Mastery-approach goals will moderate the relationship between the negative performance-goal discrepancy and perceived self-efficacy toward the original goal.

Hypothesis 12: Mastery-approach goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 13: Mastery-avoidance goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 14: Mastery-approach goals will not moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 15: Mastery-approach goals will not moderate the relationship between the negative performance-goal discrepancy and proximal goal.

Hypothesis 16: Mastery-avoidance goals will not moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 17: Mastery-avoidance goals will not moderate the relationship between the negative performance-goal discrepancy and proximal goal.

Hypothesis 18: Mastery-approach goals will have a significant direct positive effect on proximal goal.

Hypothesis 19: Mastery-avoidance goals will have a significant direct positive effect on proximal goal.

Hypothesis 20: Performance-approach goals will moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 21: Performance-avoidance goals will moderate the relationship between the negative performance-goal discrepancy and future affective self-evaluation.

Hypothesis 22: Performance-approach goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 23: Performance-avoidance goals will not have a significant direct effect on future affective self-evaluation.

Hypothesis 24: Performance-avoidance goals will have a significant direct negative effect on the perceived self-efficacy toward original goal.

Hypothesis 25: Performance-approach goals will have a significant direct positive effect on proximal goal.

Hypothesis 26: Performance-avoidance goals will have a significant direct positive effect on proximal goal.

In this chapter, a social cognitive framework was used to explore the role of self-reactive influences on cognitive motivation. The links between all three self-reactive influences were also examined and, achievement goals were presented as a way to explain variance in self-reactive influences and intended effort. The next chapter will present the methods used in the study to test the two overarching hypotheses that (1) the self-reactive influences mediate the effects of the negative performance-goal discrepancies on intended effort; and that (2) achievement goals influence intended effort

in the context of negative performance-goal discrepancies through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences.

Chapter 3: Methodology

This chapter provides the methods and procedures used in the present study. Detailed information on the research design, participants, general procedures, apparatus, measures and statistical analyses is presented. In order to answer the research questions posed at the outset of this dissertation, a longitudinal design based on an authentic classroom setting was used.

Participants

A total of 496 undergraduate students enrolled at a Southern university in the spring 2010 semester participated in the study. As the present study focused on how students remain motivated after receiving negative performance feedback, only students who failed to achieve their minimum satisfactory grade for Exam 1 (N = 451) were retained for the present study (i.e., only negative performance feedback). Out of these 451 students, 188 (41.7%) were male and 263 (58.3%) were female. These students were recruited from five large courses across the university: two sections of introduction to microeconomics (n = 129), one section of introduction to macroeconomics (n = 124), one section of microbiology (n = 116), and one section of general chemistry (n = 82). Most were freshmen (37.0%), sophomores (35.6%) or juniors (22.3%) at the university. The remaining 5.1% of participants consisted of 3.8% seniors and 1.3% unspecified. The sample had a mean age of 22.3 years (mode = 19). Students' ethnicity was distributed as follows: 60.9% Caucasian, 32.3% African American, 2.6% Asian, .7% Hispanic, .2% Native American, and 3.3% others.

General Procedure

After obtaining proper Institutional Review Board (IRB) approval and professors' authorization to use their classrooms for data collection, data was collected in the spring 2010 semester. The researcher administrated student questionnaires at two different times in the semester at the beginning of students' classes. Each questionnaire took students about 10 minutes to complete.

At Time 1 (T1), which occurred within the first 3 weeks of the spring 2010 semester, the researcher met with students and briefly explained what would be involved if they decided to participate in the study. The introductory instructions describing the nature of the study were identical for all participants. The study was presented as part of a dissertation data collection process designed to investigate the effects of goal setting in education. Students were not given any extrinsic incentive to participate in the study. An informed consent (Appendix A) was obtained for each participant prior to data collection indicating their willingness to participate in the study. Participants were given assurance that their participation was voluntary, withdrawal was permitted from the study at any time, and their identity would not be revealed. After reading the information provided in the consent form (Appendix A), the students decided whether or not to participate in the study. By signing their name on the consent form, students indicated that they had read and understood the information provided in the consent form. Students were also asked to provide another signature on the consent form if they agreed to allow the researcher to ask their professor to release their grades at the end of the semester. Students were insured that their name would not be linked to the grades. All students who agreed to participate (N = 496) also agreed for the release of their grades. Students who decided to

participate were given Questionnaire 1 (Appendix B) to fill-in. Questionnaire 1 collected participants' demographic information, achievement goal orientation and goal setting data. Students who chose not to participate were asked to wait in the classroom while the participating students filled the questionnaire.

In a traditional classroom environment, performance feedback is routinely used. Upon receiving performance feedback, students are assumed to engage in normative comparisons of their performance with a personal standard (Bandura, 1991a, 1991b; Carver & Scheier, 1998). As the current study focuses on cognitive motivation based on goal intentions, participating students were prompted to set goals for themselves. In other words, they implicitly set personal standards for themselves and therefore had both comparative factors (a goal and performance feedback) required for the activation of self-reactive influences (Bandura & Cervone, 1983).

At Time 2 (T2), which occurred approximately one week after participants received their grade back from their first exam (Exam 1) and approximately one month after T1 data collection, participants were asked to complete Questionnaire 2 (Appendix C). At this time, participants reported their Exam 1 grade as well as information about their affective self-evaluation, self-efficacy for goal attainment, goal setting information and intended effort.

At the end of the semester, the actual student Exam 1 grades were provided by the professors to the researcher. These grades rather than the student self-reported grades were the ones used to compute the performance-goal discrepancy variable.

Apparatus

Consistent with the current methods used in education research (Ary, Jacobs & Razavieh, 2002), self-administered questionnaires were used to collect data from participants. Two different questionnaires were used for the study. Questionnaire 1 (Appendix B) was administered at T1 while questionnaire 2 (Appendix C) was administered at T2.

Questionnaire 1 Measures (T1)

Demographic data. Five questions collected students' demographic information (gender, ethnicity, age, academic department, and class standing). A combination of multiple choice questions and fill-in the blank (for age) was used to collect the demographic data.

Achievement Goal Questionnaire - Revised (AGQ-R). The AGQ-R is a 12-item (4 x 3 items) instrument, with three items serving as indicators for each of the four achievement goals: (1) mastery-approach (item 1, 3, 7); (2) mastery-avoidance (item 5, 9, 11); (3) performance-approach (item 2, 4, 8); and (4) performance-avoidance (item 6, 10, 12). Participants indicated the extent to which they agreed with each item using a scale of 1 ("strongly disagree") to 5 ("strongly agree").

The structural validity and predictive utility of the revised AGQ (AGQ-R) was recently demonstrated on a sample of undergraduate students (Elliot & Murayama, 2008). In their Confirmatory Factor Analysis (CFA), Elliot and Murayama (2008) obtained high factor loadings ranging from .93 to .73. In the present study, all of four subscales demonstrated high levels of internal consistency with Cronbach's α of .84, .88, .92, and .94, for mastery-approach goals, mastery-avoidance goals, performance-approach goals,

and performance-avoidance goals respectively. Appendix D presents each item under their corresponding achievement goal.

Initial goal setting: distal goal and proximal goal. Contrary to previous studies involving goal setting (e.g., Bandura & Cervone, 1983; 1986), participants' goals were not controlled, but rather allowed to naturally deviate as they do in a classroom. Participants were free to set their own initial goals. This choice-procedure was thought to increase students' sense of self-determination and commitment to the goals (Kiesler, 1971; Langer, 1975) which in turn was thought to lead to more authentic results. Participants set their goals using the traditional 1-100 scale. They first set their distal goal (i.e., overall course grade). However, this served mainly as a filler item. For the second self-set goal, which is the one that was used to compute the performance-goal discrepancy, participants set their proximal goal (i.e., Exam 1 grade).

Locke and Bryan (1968) investigated numerous variations in question formats for goal setting (e.g., hoped for, tried for, expected grades). They found two important highly correlated measures (r = .67) for deriving valid ratings of college students' academic grade goals: one's expected grade and one's minimum satisfactory grade goal. The question asking about one's minimum satisfactory grade goal was found to not only be the most reliable question format (Locke & Bryan, 1968), but also the one that was the most influenced by performance feedback (Festinger, 1942; Holt, 1946). For these reasons, participants in the current study were asked to report their minimum satisfactory grades for both their distal goal (i.e., overall course grade) and proximal goal (i.e., Exam 1 grade).

Questionnaire 2 Measures (T2)

Self-reported grade. At T2, participants were asked to report their numerical grade on Exam 1 using the traditional 1-100 scale. This grade served as a filler as the actual grade received on Exam 1 rather than the self-reported grade was the performance used to compute the performance-goal discrepancy. As the self-reactive influences variables depended on the student reactions to their Exam 1 grade, students who reported receiving a different grade on Exam 1 than their actual grade (as reported by their professor at the end of the semester) were not included in the sample used in the study.

Affective self-evaluation. Similarly to Bandura and Cervone's (1983; 1986) studies, participants rated their affective self-evaluation on a 25-point scale ranging from "highly dissatisfied", through "neutral", to "highly satisfied". They first rated their level of satisfaction with their performance on Exam 1. This rating however just serve as a filler item as it is the affective self-evaluation for subsequent test (i.e., future affective self-evaluation) rather than the affective self-evaluation of past test that is the critical motivator (Bandura & Cervone, 1986). For the second rating, which was the relevant one to the hypothesized relationships, participants rated how satisfied they would be if they were to obtain the same grade on the next exam (Exam 2).

Perceived self-efficacy for goal attainment. Similarly to Bandura and Cervone's study (1983, 1986), participants reported their perceived self-efficacy for goal attainments using a 100-point scale, ranging in 10-unit intervals from "cannot do at all", to "moderately certain can do", to "highly certain can do". In other words, they indicated how confident they were that they could achieve their pre-set goals. Three types of perceived self-efficacy for goal attainment was recorded: (1) the self-efficacy for the

attainment of the original distal goal (the minimum satisfactory grade set for the overall course grade at T1), (2) the self-efficacy for the attainment of the next proximal goal (the minimum satisfactory grade set for Exam 2 at T2), and (3) the self-efficacy for the attainment of the adjusted distal goal (the minimum satisfactory grade set for the overall course grade at T2). As previous research has shown that the strength of perceived self-efficacy toward the original goal is more predictive of how much effort subjects enlist in a task (Bandura & Cervone, 1983, 1986), participants' self-efficacy for their original distal goal attainment was expected to be the most predictive of intended effort. Preliminary analyses confirmed this hypothesis by comparing the effects of the three different types of perceived self-efficacy on intended effort. Consistent with prior studies, the perceived self-efficacy toward the original goal was the most predictive type of self-efficacy and thus the measure retained for the final model.

Goal setting. Similarly to the initial goal setting of T1, participants indicated their minimum satisfactory grade for the overall course grade (distal goal) as well as for the next exam (proximal goal) using the traditional 1-100 scale. Again, participants' distal goal (i.e., overall course grade) served as a filler item. The proximal goal was the one relevant to the hypothesized relationships.

Intended effort. Similarly to Bandura and Cervone's (1983, 1986) studies, cognitive motivation in the present study was conceived as a change in effort. Thus, much like in Campion and Lord's (1982) study, participants indicated how much effort they intended to put toward their next exam (Exam 2) on a 7-point scale ranging from "much less effort", through "same effort, to "much more effort".

Data Analysis

In order to test the overarching hypotheses that self-reactive influences mediate the effects of the negative performance-goal discrepancies on intended effort and, that achievement goals influence intended effort through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences, the current study used a path model analysis (Analysis 1) and several hierarchical linear regression (HLR) analyses (Analysis 2). Before conducting statistical analyses, the data was checked for potential multicollinearity and outliers problems.

The first analysis (Analysis 1) conducted in the present study was a path model analysis for intended effort. The direction of causality in the path model (Figure 3) was established by theoretical considerations supported by prior research as well as temporal sequencing of variables. This sequential model suggests that achievement goals predict all three self-reactive influences, that future affective self-evaluation predicts perceived self-efficacy toward the original goal, that perceived self-efficacy toward the original goal predict proximal goal and that all three self-reactive influences predict intended effort. By design, the model suggests that the relationships between constructs that occur early in the model (e.g., achievement goals, future affective self-evaluation) with those that come later in the sequence (e.g., proximal goal, intended effort) are at least partially mediated by the interceding constructs (i.e., perceived self-efficacy). Even though not all variables were expected to be directly linked to each other (e.g., the performance-goal discrepancy was only expected to exert an indirect effect on intended effort through the mediating self-reactive influence variables), every potential direct link was examined.

Figure 3 presents the model with all the relationships that were tested for in the current study.

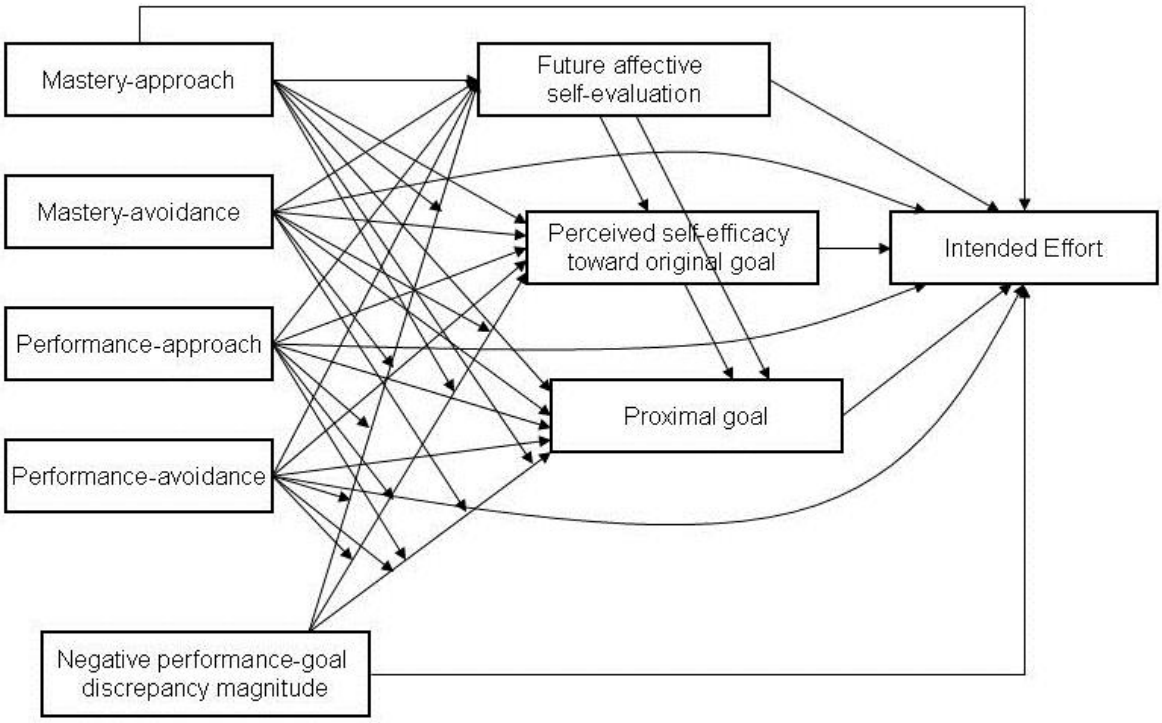

Figure 3. Tested model

The magnitude of the negative performance-goal discrepancy, the only exogenous variable in the model, was entered into the analysis in step 1. The other independent measures in the path model were the three self-reactive influences. Future affective self-evaluation was entered in step 2, perceived self-efficacy toward original goal was entered in step 3 and proximal goal was entered in step 4. The main outcome variable (i.e., main dependent measure) was intended effort.

Zero-order Pearson product correlations, means and standard deviations (*SD*) were computed for all five measured variables of the path model analysis. SPSS.17 for Windows and GEMINI, a FORTRAN program developed by Wolfle and Ethington (as cited in Ethington, 1990) were used to compute the causal effects implied by the model. Direct, indirect, and total effects were calculated. The direct effects were represented by standardized regression coefficients (betas, β). The statistical significance of the direct effects was determined using GEMINI. The indirect effects were also approximated by the sums of the direct effect products through mediating variables in the model. They measured the effect of the intervening variables. The significance of the indirect effects was tested with GEMINI. The sum of the direct and indirect effects produced the total effects. The statistical significance of the total effects was determined with SPSS. The absolute values of the coefficients were compared in order to determine the order of influence of each variable. Additionally, four ordinary least squares regression equations (one equation for each step of the path model analysis) were computed. Adjusted R^2 and R^2 changes were calculated in order to determine the amount of variance in intended effort explained by each independent variable.

The second analysis (Analysis 2) conducted with SPSS.17 involved several hierarchical linear regressions (HLR). This analysis tested for the influence of achievement goals on the self-reactive influences and intended effort. As a preliminary analysis, a confirmatory factor analysis (CFA) was conducted on the AGQ-R achievement goals items using Amos 18™ (Arbuckle, 2009) to verify the hypothesized 2 × 2 achievement goal structure. The analysis was performed on covariance matrices. The parameters were estimated by maximum-likelihood. Correlations, means, standard

deviations were calculated for all four achievement goals. In addition, Cronbach's alphas were computed to measure the internal reliability of each of the four achievement goal scales.

For each of the four achievement goals and for each of the three self-reactive influences, hierarchical linear regressions (HLR) were used to examine the main effects of the magnitude of the negative performance-goal discrepancy, the main effects of the specific achievement goal after controlling for the discrepancy and interactions among these variables as predictors of the specific self-reactive influence. Similarly, hierarchical linear regressions (HLR) were used to examine the main effects of the magnitude of the negative performance-goal discrepancy, the main effects of the specific achievement goal after controlling for the discrepancy and interactions among these variables as predictors of intended effort. That is, these hierarchical linear regression analyses aimed at answering the following questions for each of the four achievement goals: (1) Does the magnitude of the performance-goal discrepancy predict the self-reactive influence / intended effort? (2) Does the achievement goal predict the self-reactive influence / intended effort after controlling for the magnitude of the discrepancy? (i.e. mediation effect); and (3) Does the product term (discrepancy x achievement goal) predict the self-reactive influence / intended effort? (moderation effect). Stated differently, the purpose of this last question was to test whether the relationship between the magnitude of the discrepancy and the three self-reactive influences / intended effort was the same or different between (1) students with high mastery-approach goals and students with low mastery-approach goals, (2) students with high mastery-avoidance goals and students with low mastery-avoidance goals, (3) students with high

performance-approach goals and students with low performance-approach goals, and (4) students with high performance-avoidance goals and students with low performance-avoidance goals.

There were three steps in the HLR models. In the first step, the self-reactive influence / intended effort was regressed upon the magnitude of the performance-goal discrepancy. In the second step, the achievement goal index was entered. Finally, in the third step, the first order interaction between the discrepancy and the achievement goal index was entered. In order to examine the potential interaction between the performance-goal discrepancy and the achievement goal index, the regressions of the discrepancy on each of the self-reactive influences and intended effort at particular values of achievement goals were the main interest. Because each achievement goal index was continuous, one standard deviation below the mean, and one standard deviation above the mean were chosen to compute the simple slopes. Using the guidelines presented by Aiken and West (1991), the variables were centered prior to creating the interaction terms in order to reduce multicollinearity. Steps were not interpreted unless they accounted for a significant amount of variance above and beyond the previous step. The final betas (i.e., the standardized beta values at step 3) are the beta values reported in the results chapter.

In this chapter, the methods used in the current study were described. The participants, general procedure, apparatus and data analysis were presented. Specifically, this chapter delineated how a path model (Analysis One) and hierarchical regression analyses (Analysis Two) would be used to test the two overarching hypotheses that (1) the self-reactive influences mediate the effects of the negative performance-goal

discrepancies on intended effort; and that (2) achievement goals influence intended effort in the context of negative performance-goal discrepancies through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences. The next chapter will detail the results from each of the two analyses.

Chapter 4: Results

This chapter presents the research findings from the current study. The results of the path model analysis predicting intended effort are displayed first (Analysis One). Means for and intercorrelations between all five variables are presented along with the direct, indirect and total effects for all four regression equations. Results from the ordinary least squares regressions are also provided. Secondly, the results of the hierarchical linear regressions which considered each of the four achievement goal indexes as potential mediator and/or moderator of the relationships between the performance-goal discrepancy and each of the three self-reactive influences as well as the relationship between the performance-goal discrepancy and intended effort are presented (Analysis Two). The results of the CFA which verified the hypothesized 2 × 2 achievement goal structure and provided evidence for the use of the four achievement goals for Analysis Two are also provided.

Analysis 1: Intended Effort Path Model Analysis

Means and Intercorrelations

Data were checked for potential outliers and multicollinearity problems. After removing eleven outliers from the sample, the data were found to satisfy the assumptions for multiple linear regressions. For each of the measured variables, preliminary analyses revealed no statistical differences across courses, gender, ethnicities, and class standings. Age was also not correlated with any of the measured variables. Correlations, means and standard deviations for all five variables of the model are provided in Table 1.

The mean for the magnitude of the performance-goal discrepancy indicated that participants failed to achieve their set-goal for Exam 1 by an average of 19.14 points

(participants' grade were out of a possible 100). The mean for future affective self-evaluation (6.44 out of a 25-point scale) indicated that participants reported a moderately high level of dissatisfaction if they were to obtain the same grade on the next exam. The mean for the self-efficacy toward the original goal (69.93 out of 100) suggested that, overall, participants remained relatively confident that they could achieve their pre-set initial distal goal even though they had failed to achieve their pre-set goal for Exam 1. The mean for proximal goal (84.12 out of 100) indicated that participants had moderately high expectations for their next exam. The mean for intended effort (6.37 out of a 7-point scale) showed that after having received their grade back from their first exam (which was below their pre-set goal for Exam 1), participants reported high levels of cognitive motivation toward their next exam.

Table 1

Summary of Intercorrelations, Means, and Standard Deviations

Measure	*1*	*2*	*3*	*4*	*5*
1. Discrepancy (magnitude)	1.000				
2. Future affective self-evaluation	-.482**	1.000			
3. Self-efficacy (original goal)	-.263**	.240**	1.000		
4. Proximal goal	-.125*	.145**	.342**	1.000	
5. Intended effort	.172**	-.297**	.032	-.037	1.000
M	19.14	6.44	69.93	84.12	6.37
SD	15.84	6.89	22.68	7.98	.88

Note. $N = 440$. *$p < .01$. **$p < .001$.

Path Model Parameter Estimates

Table 2 summarizes the decomposition of the zero-order correlations between all independent variables and each dependent variable for all four regression equations. All parameter estimates (direct, indirect and total effects) are presented in the table. Figure 4 illustrates the estimated model.

Table 2

Decomposition of Zero-Order Correlations between all Independent Variables and Each Intervening Causal Variable and the Dependent Variable

Independent variable	Direct effect	Indirect effect	Total effect	*r*
Intervening causal variable: Future affective self-evaluation				
Discrepancy (magnitude)	-.482**	0	-.482**	-.482**
Intervening causal variable: Self-efficacy toward the original goal				
Discrepancy (magnitude)	-.192**	-.071*	-.263**	-.263**
Future affective self-evaluation	.147*	0	.147*	.240**
Intervening causal variable: Proximal Goal				
Discrepancy (magnitude)	-.009	-.115**	-.125*	-.125*
Future affective self-evaluation	.062	.048*	.110*	.145**
Self-efficacy	.324**	0	.324**	.342**
Dependent variable: Intended effort				
Discrepancy (magnitude)	.060	.112**	.172**	.172**
Future affective self-evaluation	-.294**	.016	-.279**	-.297**
Self-efficacy	.129*	-.010	.119*	.032
Proximal Goal	-.031	0	-.031	-.037

Note. $N = 440$. $*p < .01$. $**p < .001$.

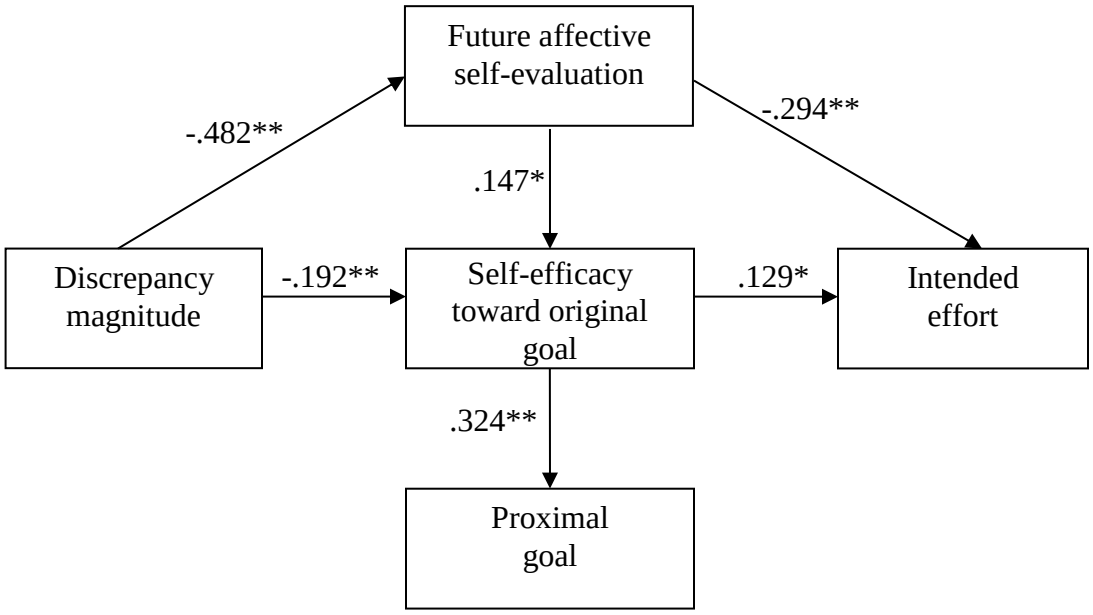

Figure 4. Estimated model for intended effort. *$p < .01$. **$p < .001$.

The reminder of this section will describe the direct, indirect and total effects in further details.

Direct effects. Most of the hypothesized paths were confirmed by the analysis. As predicted, the magnitude of the performance-goal discrepancy was found to exert a direct negative influence on both future affective self-evaluation ($\beta = -.482$, $p < .001$), and self-efficacy toward the original goal ($\beta = -.192$, $p < .001$). Additionally, the analysis confirmed the hypothesized lack of direct influence of the discrepancy on intended effort. The magnitude of the discrepancy did not have any direct influence on proximal goal.

As hypothesized, future affective self-evaluation was found to have a direct positive impact on self-efficacy toward the original goal ($\beta = .147$, $p < .01$) and a direct

negative influence on intended effort (β = -.297, p < .001). Similarly, the analysis confirmed the hypothesized direct positive paths between self-efficacy toward the original goal and proximal goal (β = .324, p < .001) and, self-efficacy toward the original goal and intended effort (β = .129, p < .01). The hypothesized direct positive effect of proximal goal on intended effort was not verified.

Indirect effects. The magnitude of the discrepancy was found to have an indirect negative effect on both self-efficacy toward the original goal (-.071, p < .01 through the mediating factor, future affective self-evaluation) and proximal goal (-.115, p < .001). The indirect effect of discrepancy through self-efficacy (-.062) contributed the most to the total indirect effect of discrepancy on proximal goal. The indirect effects through future affective self-evaluation (-.030) and both future affective self-evaluation and self-efficacy toward the original goal (-.023) had similar weight on the total indirect effects of the discrepancy on proximal goal. Lastly, the magnitude of the discrepancy had a positive indirect effect on intended effort (.112, p < .001). With regard to the indirect effect of the discrepancy on intended effort, future affective self-evaluation was the most influential mediating variable (.142). Future affective self-evaluation had an indirect positive influence on proximal goal (.048, p < .01) through the mediating variable self-efficacy toward the original goal.

Total effects. The magnitude of the discrepancy had the biggest total influence on self-efficacy toward the original goal (-.263, p < .001) as a result of both its significant direct effect (β = -.192, p < .001) and indirect effect (-.071, p < .01). Future affective self-evaluation also exerted a significant total effect on self-efficacy due to its direct positive effect (β = .147, p < .01).

Self-efficacy toward the original goal had the biggest total effect on proximal goal due to its significant direct effect (β = .324, p < .001). The magnitude of the discrepancy had the second greatest influence on proximal goal (-.125, p < .01). This total effect was mostly due to its indirect effect (-.115, p < .001). Future affective self-evaluation was the last influential variable on proximal goal (.110, p < .01) as a result of its indirect effect (.048, p < .01).

Future affective self-evaluation had the biggest total effect on intended effort (-.279 p < .001). This total effect was mostly due to its direct effect (β = -.294, p < .001). The second most influential variable on intended effort was the magnitude of the discrepancy (.172, p < .001). The indirect effect of the discrepancy on intended effort (.112, p < .001) was the major contributor to this total effect. Lastly, self-efficacy toward the original goal came third in the order of influence on intended effort (.119, p < .01) due to its direct effect (β = .129, p < .01). Proximal goal had no impact on intended effort.

Regression Equations

Four regression equations were computed. These equations allowed an examination of whether variation in intended effort could be explained by variables above and beyond the performance-goal discrepancy. The results from the ordinary least squares regressions are presented in Table 3.

Intended effort was the main outcome variable in the hierarchical linear regression. The performance-goal discrepancy, the only exogenous variable in the model, was entered into the analysis in step 1. At this step, the model yielded an adjusted R^2 of .027 (β = .172, p < .001). At step 2, the future affective self-evaluation variable was entered

and explained an additional 5.8% of variance in intended effort (adjusted R^2 of .085, β = -.279, $p < .001$). At step 3, the self-efficacy toward the original goal variable was added and explained an additional 1.1% of variance in intended effort (adjusted R^2 of .096, β = -.119, $p < .01$). Lastly, the proximal goal variable was added in step 4. The proximal goal variable failed to explain any more variance in intended effort.

Table 3

Hierarchical Multiple Regression Analysis for Variables Predicting Intended Effort

Predictor	ΔR^2	β
Step 1	.027**	
Discrepancy (magnitude)		.172**
Step 2	.058**	
Discrepancy (magnitude)		.037
Future affective self-evaluation		-.279**
Step 3	.011*	
Discrepancy (magnitude)		.060
Future affective self-evaluation		-.297**
Self-efficacy		.119*
Step 4	-.001	
Discrepancy (magnitude)		.060
Future affective self-evaluation		-.294**
Self-efficacy		.129*
Proximal Goal		-.031
Total R^2	.095**	

Note. N = 440. Adjusted R^2 are the R^2 values reported in the table. *$p < .01$. **$p < .001$.

Analysis 2: Testing for the Influence of Achievement Goals on the SRIs and Intended Effort

The path model for intended effort performed in the first analysis uncovered the influence of the performance-goal discrepancy on two of the self-reactive influences: future affective self-evaluation and perceived self-efficacy toward the original goal. The

purpose of the second analysis was to explain more variance within the three self-reactive influences as well as within intended effort by addressing the role of achievement goals. Hierarchical linear regressions (HLR) were used to determine the main effects of each achievement goals on each of the three self-reactive influences as well as the moderating effects of each achievement goals on the relationship between discrepancy and each of the three self-reactive influences. Similarly, the main effects of each achievement goals on intended effort as well as the moderating effects of each achievement goals on the relationship between discrepancy and intended effort were examined. A confirmatory factor analysis (CFA) was performed as preliminary analysis to verify the hypothesized 2 × 2 achievement goal structure. The results of the CFA will be presented next. The results of each hierarchical linear regression analysis will follow.

Factorial Structure of Achievement Goals

In accordance with Hoyle and Panter (1995), several indexes including chi-square degree of freedom ratio (χ^2/df), comparative fit index (CFI), incremental fit index (IFI), and root-mean-square error of approximation (RMSEA) were used to evaluate the adequacy of the hypothesized 2 × 2 achievement goal model to the data. The following criteria were used to evaluate the fit of the model: $\chi^2/df \leq 2.0$ (Hair, Anderson, Tatham, & Black, 1998), CFI $\geq .90$, IFI $\geq .90$, and RMSEA $\leq .08$ (Browne & Cudeck, 1993). Figure 5 illustrates the factor loadings and Pearson product moment correlations for the hypothesized 2 × 2 achievement goal model.

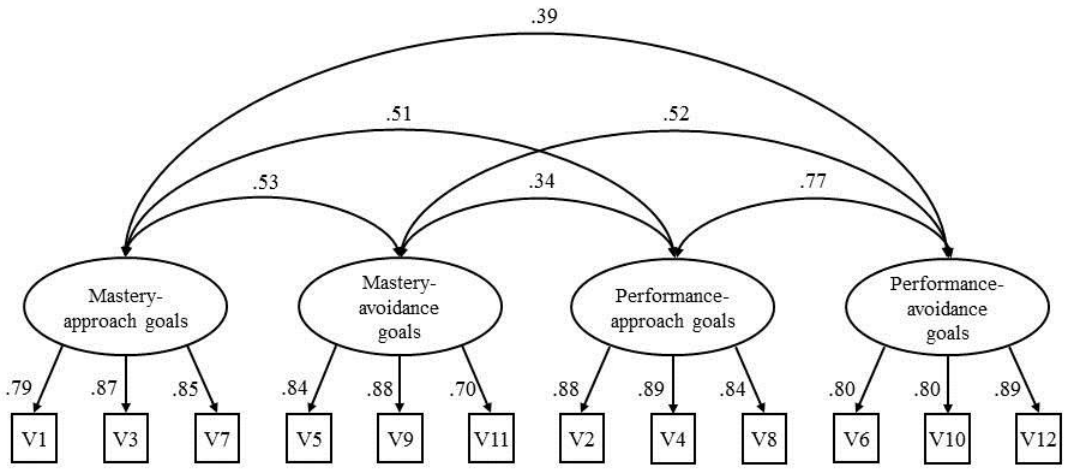

Figure 5. Confirmatory factor analysis of the achievement goal items. Estimates are standardized. All coefficients are significant ($p < .01$). Error variables are not represented in order to simplify the figure. V1−V12 represent the individual items of the AGQ-R scale (numbers indicate the order of the items in the questionnaire; refer to Appendix D).

Three of four fit statistics met the criteria for a good fitting model (CFI = .94, IFI = .94, RMSEA = .072) while one statistic was close to indicating acceptable fit ($\chi^2(48, n = 440) = 271.29$, $p < .01$, $\chi^2/df = 5.65$). All factor loadings were acceptable and ranged from .70 to .89. Participants' responses on the items for each of the four hypothesized factors were therefore averaged to form the four achievement goal indexes.

Each index showed good levels of internal consistency as indicated by the reliability measure Cronbach's alpha (1951). Cronbach's alphas ranged from .84 to .90 demonstrating good ($.8 \leq \alpha < 0.9$, George & Mallery, 2003) to excellent ($0.9 \leq \alpha$, George & Mallery, 2003) levels of internal consistency. They were .88, .84, .90, and .88 for mastery-approach goals, mastery-avoidance goals, performance-approach goals, and performance-avoidance goals, respectively. In sum, the CFA results and reliability data

showed that the achievement goal measures represented four empirically separable and internally consistent achievement goal indexes.

Means for and intercorrelations among the achievement goal measures. Table 4 illustrates the descriptive statistics and intercorrelations among the achievement goal indexes.

Table 4

Study 2: Descriptive Statistics, Reliabilities, and Intercorrelations Among Measures

Achievement goal	Observed range	Possible range	Cronbach's α	Variable 1	2	3	4
1. Mastery-approach goals	1−5	1−5	.88	−			
2. Mastery-avoidance goals	1−5	1−5	.84	.53**	−		
3. Performance-approach goals	1−5	1−5	.90	.51**	.34**	−	
4. Performance-avoidance goals	1−5	1−5	.88	.39**	.52**	.77**	−
M				4.22	3.86	3.90	3.88
SD				.811	.08	.961	.04

Note. $^{**}p < .01$.

The means for mastery-approach goals (4.22 out of 5), mastery-avoidance goals (3.86 out of 5), performance-approach goals (3.90 out of 5), and performance-avoidance goals (3.88 out of 5) indicate that all four goals were clearly operative in this study. However, mastery-approach goals appeared to be the most prevalent form of goal regulation. The above significant correlations between all four of the achievement goals indicate that all four types of students' achievement goals are positively associated. An examination of the means and standard deviations points out that students tend to have similar levels of achievement goals on all four indexes. In fact, most students (n = 232, 51.5%) did not report a higher level of achievement goal on one single achievement goal. These students reported the same high level of achievement goals on two or more types

of achievement goals. In addition, those students who did have a higher level on one single achievement goal (n = 219, 48.5%) usually had similar high measure level(s) on other achievement goals. Stated differently, the second (and sometimes third and fourth) highest achievement goal level was relatively close to the highest achievement goal level. Attributing a single main goal orientation to each student in the context of the present study would thus have been inappropriate. It would not be consistent to compare the four types of achievement goals against each other as students seem to adopt multiple achievement goals. Instead, the present study addressed the role of the four different achievement goal indexes separately by focusing on the main effects of each achievement goal as well as on the potential interaction of each achievement goal with the performance-goal discrepancy.

Hierarchical Linear Regression Analyses Predicting Future Affective Self-Evaluation

Results of the HLR models predicting future affective self-evaluation for each of the four achievement goal index are summarized in Table 5. Figure 6 illustrates the results for the HLR analyses predicting future affective self-evaluation.

Table 5

Hierarchical Multiple Regression Analyses Predicting Future Affective Self-Evaluation

	Achievement Goal Indexes							
	Mastery-approach		Mastery-avoidance		Performance-approach		Performance-avoidance	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.245***		.226***		.216***		.232***	
Discrepancy (magnitude)		-.495***		-.475***		-.465***		-.481***
Step 2	.003		.004		.006		.003	
Discrepancy (magnitude)		-.500***		-.476***		-.457***		-.473***
Achievement goal index		-.053		-.064		.075		.060
Step 3	.003		.001		.018*		.024*	
Discrepancy (magnitude)		-.428***		-.440***		-.355***		-.257*
Achievement goals		-.045		-.063		.069		.081
Discrepancy x Ach. goal index		-.092		-.047		-.169*		-.265*
Total R^2	.251***		.231***		.239***		.260***	
n	216		199		277		181	

Note. Adjusted R^2 are the R^2 values reported in the table. For each achievement goal, the values of one standard deviation above the mean of the achievement goal and one standard deviation below the mean of the achievement goal were used to compute the effects of the discrepancy on future affective self-evaluation (i.e., two levels of the moderator). *p < .05. **p < .01. ***p < .001.

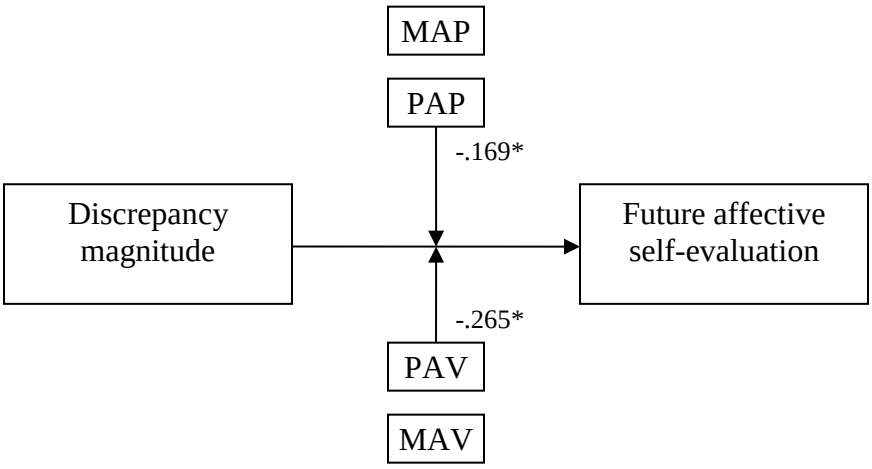

Figure 6. Summary of the results for the HLR analyses predicting future affective self-evaluation. *p < .05. **p < .01. ***p < .001.

The reminder of this section describes the role of each achievement goals on future affective self-evaluation in further details.

Mastery-approach index. The final HLR model accounted for 25.1% of the variance in future affective self-evaluation (R^2 = .251, p < .001). This significant amount of variance explained resulted from the significant negative main effect of the discrepancy on future affective self-evaluation (β = -.428, p < .001, R^2 = .245). Mastery-approach goals and the interaction between discrepancy and mastery-approach goals did not significantly predict variance in future affective self-evaluation.

Mastery-avoidance index. Results for the mastery-avoidance index were similar to the results found for the mastery-approach index. The final model explained 23.1% of variance in future affective self-evaluation (R^2 = .231, p < .001), 22.6% of it resulting from the significant negative main effect of the discrepancy on future affective self-evaluation (β = -.440, p < .001). Mastery-avoidance goals and the interaction between discrepancy and mastery-avoidance goals did not explain more variance in future affective self-evaluation.

Performance-approach index. About 24% of variance in future affective self-evaluation is explained by the final model (R^2 = .239, p < .001). The majority of the variance explained, 21.6%, resulted from the significant negative main effect of the discrepancy on future affective self-evaluation (β = -.465, p < .001). Performance-approach goals did not significantly predict variance in future affective self-evaluation. However, results indicated the presence of a significant negative two-way interaction between discrepancy and performance-approach goals (β = -.169, p < .05, R^2 change = .018).

Figure 7 illustrates the two-way interaction. Following the guidelines by Aiken and West (1991), discrepancy is presented on the x-axis, as it is considered to be the primary independent variable whose relationship with future affective self-evaluation may be modified by different levels of achievement goals. Tests of each simple slope indicated that the degree of the slopes were significantly different from zero ($t(273) = -5.38$, $p < .001$ for low performance-approach goals; $t(273) = -13.08$, $p < .001$ for high performance-approach goals).

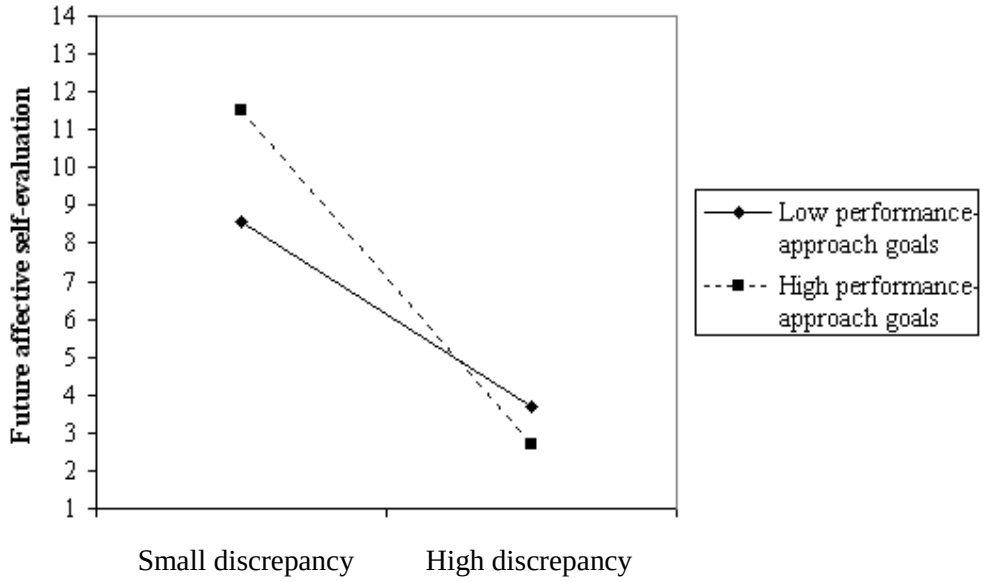

Figure 7. Two-way interaction between discrepancy and performance-approach goals for future self-evaluation. "High" and "low" values of performance-approach goals represent 1 *SD* above and below the mean, respectively.

Performance-avoidance index. Similarly to the results for the performance-approach index, the final model with performance-avoidance goals accounted for a

significant amount of variance in future affective self-evaluation (R^2 = .260, p < .001). The majority of the 26% of the variance explained, 23.2%, was attributed to the significant negative main effect of the discrepancy on future affective self-evaluation (β = -.257, p < .05). Performance-avoidance goals did not significantly predict variance in future affective self-evaluation. However, the significant negative two-way interaction between discrepancy and performance-avoidance goals explained an additional 2.4% of variance in future affective self-evaluation (β = -.265, p < .05).

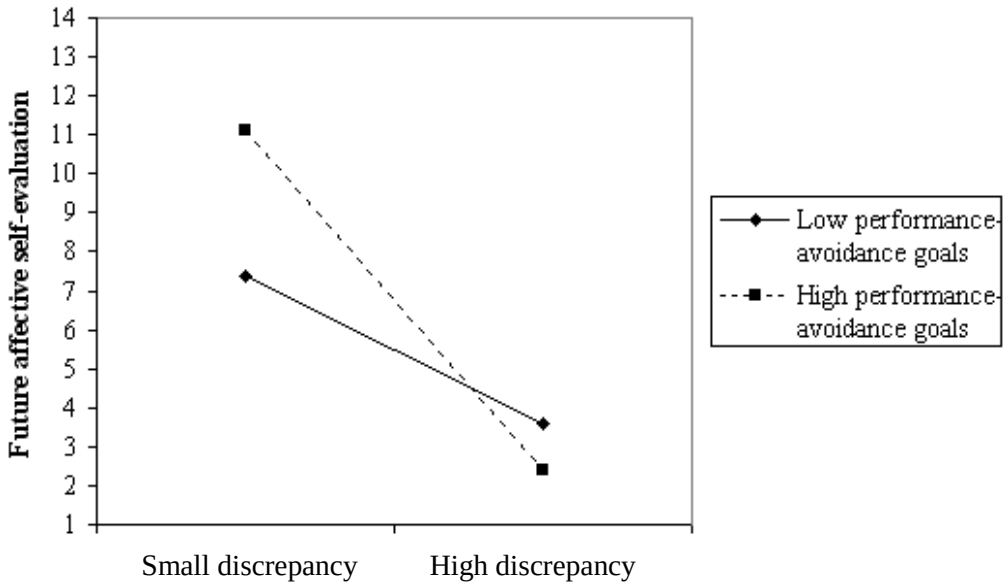

Figure 8. Two-way interaction between discrepancy and performance-avoidance goals for future self-evaluation. "High" and "low" values of performance-avoidance goals represent 1 *SD* above and below the mean, respectively.

As shown in Figure 8, performance-avoidance goals moderated the relationship between discrepancy and future affective self-evaluation. Tests of each simple slope showed that the degree of the slopes were significantly different from zero (t(177) = -

2.14, $p < .01$ for low performance-avoidance goals; $t(177) = -2.35$, $p < .01$ for high performance-avoidance goals).

Hierarchical Linear Regression Analyses Predicting Self-efficacy Toward the Original Goal

Results of the HLR models predicting self-efficacy toward the original goal for each of the four achievement goal index are showed in Table 6.

Table 6

Hierarchical Multiple Regression Analyses Predicting Self-efficacy toward the Original Goal

	Achievement Goal Indexes							
	Mastery-approach		Mastery-avoidance		Performance-approach		Performance-avoidance	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.081***		.070***		.082***		.066***	
Discrepancy (magnitude)		-.285***		-.265***		-.286***		-.257***
Step 2	.097***		.024*		.082***		.061***	
Discrepancy (magnitude)		-.258***		-.265***		-.255***		-.221**
Achievement goal index		.313***		.154*		.288***		.250***
Step 3	.034**		.003		.011		.008	
Discrepancy (magnitude)		-.486***		-.328**		-.335***		-.346**
Achievement goals		.286***		.153*		.292***		.238***
Discrepancy x Ach. goal index		.293**		.084		.132		.153
Total R^2	.213***		.097***		.175***		.135***	
n	216		199		277		181	

Note. Adjusted R^2 are the R^2 values reported in the table. For each achievement goal, the values of one standard deviation above the mean of the achievement goal and one standard deviation below the mean of the achievement goal were used to compute the effects of the discrepancy on self-efficacy (i.e., two levels of the moderator).
*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 9 illustrates the results for the HLR analyses predicting self-efficacy toward the original goal.

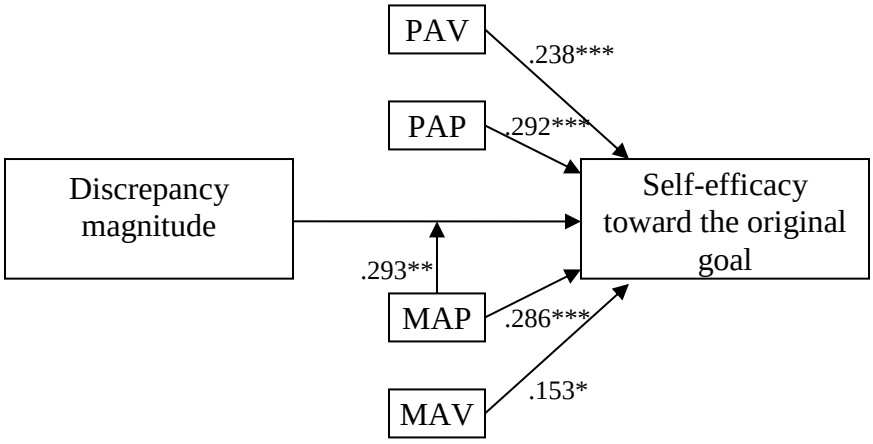

Figure 9. Summary of the results for the HLR analyses predicting self-efficacy toward original goal. *$p < .05$. **$p < .01$. ***$p < .001$.

The reminder of this section describes the role of each achievement goals on self-efficacy toward the original in further details.

Mastery-approach index. The final HLR model accounted for a significant amount of variance in self-efficacy toward the original goal ($R^2 = .213$, $p < .001$) as a result of the combination of both of the main effects and the interaction effect. The significant negative main effect of the discrepancy explained 8.1% of the variance in self-efficacy toward the original goal ($\beta = -.486$, $p < .001$). The significant main positive effect of mastery-approach goals explained an additional 9.7% of variance after controlling for the discrepancy ($\beta = .286$, $p < .001$). The estimated marginal means of self-efficacy toward the original goal were 58.1 (standard error = 3.3) and 77.4 out of 100

(standard error = 2.4) for low mastery-approach goals and high mastery-approach goals respectively. Lastly, the significant positive two-way interaction between discrepancy and mastery-approach goals accounted for 3.4% of the variance in self-efficacy toward the original goal above and beyond the two main effects (β = .293, p < .001).

The moderating effect of mastery-approach goals on the relationship between discrepancy and self-efficacy is illustrated in Figure 10. Tests of each simple slope indicated that the degree of the slope for low mastery-approach goals was significantly different from zero (t(212) = -5.01, p < .01) whereas the slope for high mastery-approach goals was not significantly different from zero (t(212) = -.51, p = .61).

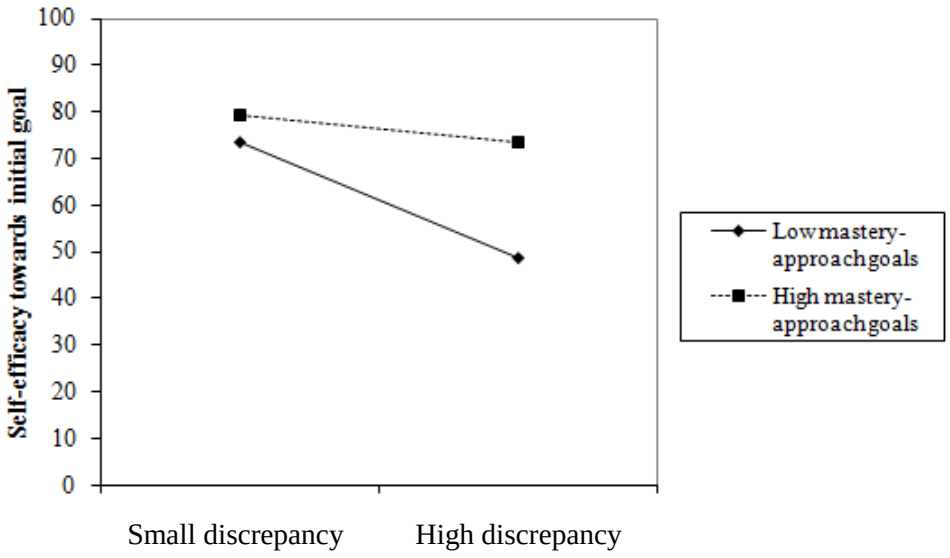

Figure 10. Two-way interaction between discrepancy and mastery-approach goals for self-efficacy toward the original goal. "High" and "low" values of mastery-approach goals represent 1 *SD* above and below the mean, respectively.

Mastery-avoidance index. The final model accounted for a significant amount of variance in self-efficacy toward the original goal (R^2 = .097, p < .001). Results indicated a significant negative main effect of the discrepancy on self-efficacy toward the original goal (β = -.328, p < .01) which explained 7% of the variance. The significant positive main effect of mastery-avoidance goals on self-efficacy for toward the original goal (β = .153, p < .05) explained an additional 2.4% of the variance. The estimated marginal means of self-efficacy toward the original goal were 66.6 (standard error = 2.6) and 74.3 out of 100 (standard error = 2.1) for low mastery-avoidance goals and high mastery-avoidance goals respectively. The interaction between discrepancy and mastery-avoidance goals did not significantly predict variance in self-efficacy toward the original goal.

Performance-approach index. The final model explained 17.5 % of the variance in self-efficacy toward the original goal (R^2 = .175, p < .001). This significant amount of variance was equally explained by the significant negative main effect of the discrepancy on self-efficacy toward the original goal (β = -.335, p < .001, R^2 = .082) and the significant positive main effect of performance-approach goals on self-efficacy toward the original goal (β = .292, p < .001, R^2 change = .082). The estimated marginal means of self-efficacy toward the original goal for low performance-approach was 63.5 (standard error = 1.7) compared to 78.5 out of 100 (standard error = 2.1) for high performance-approach goals. The interaction between discrepancy and performance-approach goals did not significantly predict variance in self-efficacy toward the original goal.

Performance-avoidance index. Similarly to the results for performance-approach goals, the total variance explained by the final model with performance-avoidance goals, 13.5% (R^2 = .135, p < .001) resulted from both main effects. The significant negative main effect of the discrepancy on self-efficacy toward the original goal (β = -.346, p < .01) explained 6.6% of the variance while the significant positive main effect of performance-avoidance goals explained 6.1% (β = .238, p < .001). The estimated marginal means of self-efficacy toward the original goal were 63.1 (standard error = 3.0) and 77.3 out of 100 (standard error = 2.1) for low performance-avoidance goals and high performance-avoidance goals respectively. The interaction between discrepancy and performance-avoidance goals did not significantly predict variance in self-efficacy toward the original goal.

Hierarchical Linear Regression Analyses Predicting Proximal Goal

Results of the HLR models predicting proximal goal for each of the four achievement goal index are presented in Table 7. Figure 11 illustrates the results for the HLR analyses predicting proximal goal.

Table 7

Hierarchical Multiple Regression Analyses Predicting Proximal Goal

	Achievement Goal Indexes							
	Mastery-approach		Mastery-avoidance		Performance-approach		Performance-avoidance	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.017		.005		.004		.003	
Discrepancy (magnitude)		-.132		-.068		-.063		-.055
Step 2	.045**		.026*		.085***		.024*	
Discrepancy (magnitude)		-.114		-.067		-.032		-.033
Achievement goal index		.212**		.162*		.293***		.156*
Step 3	.001		.008		.007		.000	
Discrepancy (magnitude)		-.147		.037		-.093		-.015
Achievement goals		.208**		.164*		.297***		.158*
Discrepancy x Ach. goal index		.043		-.139		.102		-.022
Total R^2	.063*		.039*		.095***		.027	
n	216		199		277		181	

Note. Adjusted R^2 are the R^2 values reported in the table. For each achievement goal, the values of one standard deviation above the mean of the achievement goal and one standard deviation below the mean of the achievement goal were used to compute the effects of the discrepancy on proximal goal (i.e., two levels of the moderator).
*p < .05. **p < .01. ***p < .001.

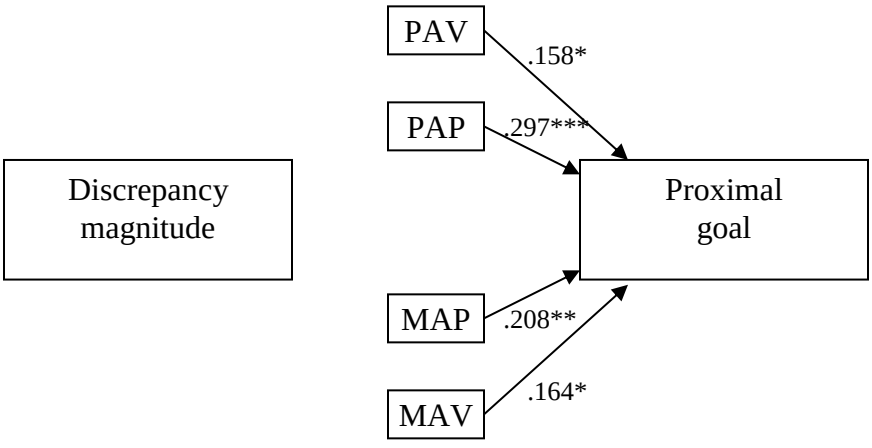

Figure 11. Summary of the results for the HLR analyses predicting proximal goal.
*p < .05. **p < .01. ***p < .001.

The reminder of this section describes the role of each achievement goals on proximal goal in further details.

Mastery-approach index. The final model accounted for a significant amount of variance in proximal goal, 6.3% (R^2 = .063, p < .05). The discrepancy did not explain any variance in proximal goal. However, the significant positive main effect of the mastery-approach goals on proximal goal (β = .208, p < .01) accounted for 4.5% of the variance. The proximal goal raw mean for low mastery-approach goals was 81.8 (standard error = .9) as opposed to 85.6 out of 100 (standard error = .7) for high mastery-approach goals. The interaction between discrepancy and mastery-approach goals did not significantly predict variance in proximal goal.

Mastery-avoidance index. Although the amount of variance in proximal goal that is accounted for by the final model appears to be small (R^2 = .039, p < .05), it was still statistically significant as a result of the significant positive main effect of the mastery-avoidance goals on proximal goal (β = .164, p < .05, R^2 change = .026). The proximal goal raw means were 83.4 (standard error = .9) and 86.1 out of 100 (standard error = .7) for low mastery-avoidance goals and high mastery-avoidance goals respectively. The discrepancy and the interaction between discrepancy and mastery-avoidance goals did not significantly predict variance in proximal goal.

Performance-approach index. The final model accounted for a significant amount of variance in proximal goal (R^2 = .095, p < .001). This total variance was predominantly explained by the significant positive main effect of the performance-approach goals on proximal goal (β = .297, p < .001, R^2 change = .085). The proximal goal raw mean for low performance-approach goals was 82.5 out of 100 (standard error =

.6). The raw mean for high performance-approach goals was 87.4 (standard error = .7). The discrepancy and the interaction between discrepancy and performance-approach goals did not significantly predict variance in proximal goal.

Performance-avoidance index. Even though results indicated a significant positive main effect of the performance-avoidance goals on proximal goal (β = .158, p < .05, R^2 change = .024), the final model did not account for a significant amount of variance in proximal goal. The proximal goal raw means were 84.3 (standard error = 1.0) and 86.9 out of 100 (standard error = .7) for low performance-avoidance and high performance-avoidance goals respectively. The discrepancy and the interaction between discrepancy and performance-avoidance goals did not significantly predict variance in proximal goal.

Hierarchical Linear Regression Analyses Predicting Intended Effort

Results of the HLR models predicting intended effort for each of the four achievement goal index are summarized in Table 8. Figure 12 illustrates the results for the HLR analyses predicting intended effort.

Table 8

Hierarchical Multiple Regression Analyses Predicting Intended Effort

	Achievement Goal Indexes							
	Mastery-approach		Mastery-avoidance		Performance - approach		Performance - avoidance	
Predictor	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.020*		.018		.019*		.037**	
Discrepancy (magnitude)		.140*		.132		.137*		.193**
Step 2	.076***		.006		.004		.008	
Discrepancy (magnitude)		.164		.133		.144*		.205**
Achievement goal index		.276**		.080		.064		.089
Step 3	.000		.001		.002		.008	
Discrepancy (magnitude)		.162		.106		.108		.081
Achievement goals		.276***		.079		.066		.077
Discrepancy x Ach. goal index		.003		.036		.060		.153
Total R^2	.096***		.024		.025		.053*	
n	216		199		277		181	

Note. Adjusted R^2 are the R^2 values reported in the table. For each achievement goal, the values of one standard deviation above the mean of the achievement goal and one standard deviation below the mean of the achievement goal were used to compute the effects of the discrepancy on intended effort (i.e., two levels of the moderator). *p < .05. **p < .01. ***p < .001.

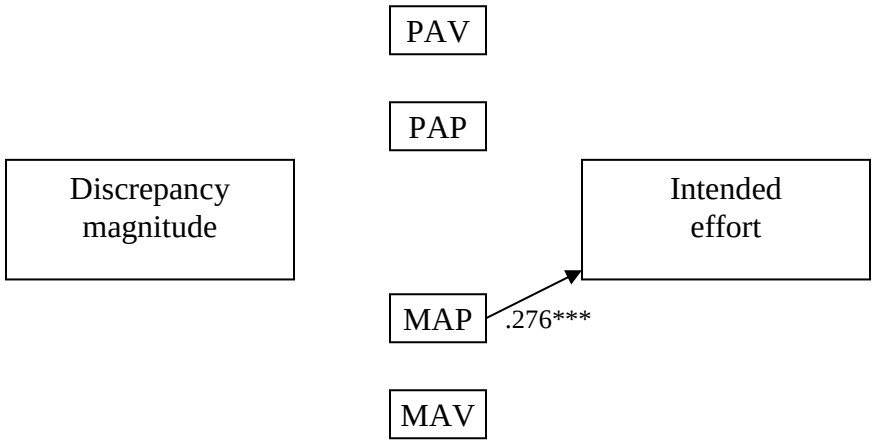

Figure 12. Summary of the results for the HLR analyses predicting intended effort. *p < .05. **p < .01. ***p < .001.

The reminder of this section describes the role of each achievement goals on intended effort in further details.

Mastery-approach index. The final model accounted for 9.6% of the variance in intended effort (R^2 = .096, p < .001) with 7.6% being attributed to the significant positive main effect of the mastery-approach goals on intended effort (β = .276, p < .001). The intended effort raw mean for low mastery-approach goals was 6.08 out of 7 (standard error = .11). The raw mean for high mastery-approach goals was 6.57 (standard error = .07). At step 1, the discrepancy explained 2.0% of variance (R^2 = .020, p < .05). However, with mastery-approach goals entered in step 2, the main effect of the discrepancy was no longer statistically significant. The interaction between discrepancy and mastery-approach goals did not significantly predict variance in intended effort.

Mastery-avoidance index. The final model did not account for a significant amount of variance in intended effort. Results indicated no significant main effects and no significant interaction.

Performance-approach index. Even though the discrepancy explained 1.9% of variance at step 1, the final model did not account for a significant amount of variance and indicated no significant main effects and no significant interaction.

Performance-avoidance index. The final model accounted for a significant amount of variance in intended effort (R^2 = .053, p < .05). The only significant beta (.193, p < .01) was found in step 1 for discrepancy which accounted for 3.7% of the variance in intended effort (R^2 = .037, p < .01). In the final model, neither of the two main effects or interaction was statistically significant.

This chapter presented the results of the path model analysis predicting intended effort as well as results from the hierarchical linear regressions which considered each of the four achievement goal indexes as potential mediator and/or moderator of the relationships between the performance-goal discrepancy and each of the three self-reactive influences as well as the relationship between the performance-goal discrepancy and intended effort. In addition to supporting the 2 × 2 achievement goal structure, findings from the current study confirmed most of the paths hypothesized based on the literature. Future affective self-evaluation was more predictive of intended effort than was the performance-goal discrepancy or self-efficacy toward the original goal attainment. Proximal goal failed to explain any more variance in intended effort. Results from hierarchical analyses confirmed the main effect of the performance-goal discrepancy on both future affective self-evaluation and self-efficacy. The discrepancy did not exert a direct effect on proximal goal. The analyses also revealed the main effects of each of the four types of achievement goals on both self-efficacy and proximal goal. However, mastery-approach goals were the only goals to exert a significant main effect on intended effort and none of the achievement goals exerted a direct influence on future affective self-evaluation. An interaction between the discrepancy and performance-approach achievement goals and an interaction between the discrepancy and performance-avoidance achievement goals partially predicted future affective self-evaluation. An interaction between discrepancy and mastery-approach achievement goals partially explained self-efficacy toward the original goal. A discussion of these findings will be presented in the next chapter.

Chapter 5: Discussion

The purpose of this study was to provide empirical data that would examine cognitive motivation in college students. Of particular interest were the role self-reactive influences and achievement goals on student cognitive motivation. Self-reactive influences consisted of three components: (1) future affective self-evaluation, (2) self-efficacy toward the original goal, and (3) proximal self-set goal. The 2 × 2 achievement goal framework was used in the present study and was comprised of mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals. This chapter includes a summary and discussion of findings, implications of findings, limitations of studies, and future directions for research.

Summary and Discussion of Findings

Motivation is one of the constructs researchers have extensively focused on in hope to understand the roots of human behavior. Though a great deal has been learned about motivation from empirical examinations of antecedents of motivation, most studies have focused on motivational differences between individuals and have either suggested that similar processes operate within individuals, or inferred that there is no systematic within-individual variance in motivation (Ilies & Judge, 2005). The present study makes a case that significant strides can be made in understanding motivation by examining the influence of within individual factors on motivation. More specifically, the current study operationalizes motivation according to cognitive motivation theory and proposes that achievement goals play an instrumental role in explaining the within-individual processes existing in cognitive motivation.

Previous research has documented the importance of self-reactive influences in relation to intended effort at various levels of performance-goal discrepancy in non-academic contexts. However, to date, much less research has been directed at documenting the role that the self-reactive influences exert in academic settings, or at investigating the influence of achievement goals on cognitive motivation. The present study attempted to fill this gap by answering the following research questions: (1) How do self-reactive influences impact cognitive motivation in the classroom environment? and (2) What are the roles of student achievement goals within cognitive motivation?

Findings from the present study provided support for the two overarching hypotheses formulated in Chapter 1. First, the self-reactive influences were found to mediate the effects of the negative performance-goal discrepancies on intended effort. Secondly, student achievement goals were found to influence intended effort in the context of negative performance-goal discrepancies through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences. Overall, the findings in the present study suggest that social cognitive theory and achievement goal theory can be adapted successfully to academic cognitive motivation, and can provide educators with a better understanding of the student self-regulation process following negative performance-goal discrepancies. The subsequent sections discuss the key findings that emerged from the present study as they relate to the above research questions.

The Mediating Role of Self-Reactive Influences in Cognitive Motivation

The motivational power of each of the three self-reactive influences on cognitive motivation and their intercorrelations with each other have been documented at various

levels of performance-goal discrepancy (e.g., Bandura & Cervone, 1986). However, accurately understanding how students motivate themselves in the pursuit of academic goals has been a challenge given that most of what is known about self-reactive influences and cognitive motivation is derived from studies that have not been conducted in academic settings. For example, Bandura and Cervone (1983, 1986) used an ergometer, an exercise device requiring effortful activity, to measure changes in motivation among students, while Cervone et al. (1991) examined the effects of self-efficacy and affective self-evaluation using a managerial decision-making simulation. The current study addressed this limitation of the cognitive motivation literature by investigating the role of the self-reactive influences within natural classroom settings.

While providing support for the significant role of the self-reactive influences in cognitive motivation, the present study's findings differ from previous findings issued from studies not conducted in academic settings. This suggests that findings from studies not conducted in academic settings might not be generalizable to the cognitive processes by which students motivate themselves in the pursuit of academic goals. The following paragraphs will address the fit of the hypotheses as well as how findings from the current study converge or diverge from past literature.

Summary and fit of the hypotheses. With the exception of one hypothesis (H_5), all hypotheses regarding the direct relationships between the magnitude of the negative performance-goal discrepancies, self-reactive influences, and intended effort were confirmed by the path model analysis. The magnitude of the negative performance-goal discrepancies had a direct negative relationship with future affective self-evaluation (H_1), and perceived self-efficacy toward the original goal (H_3). Future affective self-evaluation

and perceived self-efficacy toward the original goal were significantly directly related to intended effort (H_2, and H_4). Future affective self-evaluation was found to have a direct positive relationship with perceived self-efficacy toward the original goal (H_6); which in turn was found to have a direct positive relationship with proximal goal (H_7). Future affective self-evaluation was not significantly directly linked to proximal goal (H_8). Lastly, in addition to not be directly influenced by the magnitude of the performance-goal discrepancies, proximal goal was unexpectedly found to not be significantly linked to intended effort (H_5 not supported). Overall, these findings highlight the functionality of two of the three self-reactive influences (i.e., future affective self-evaluation and perceived self-efficacy toward the original goal) in predicting intended effort, and mediating the effects of the performance-goal discrepancy on intended effort.

Convergence and divergence with past literature. Comparing results from the present study to past studies presents a challenge as no previous study has examined the three self-reactive influences within natural classroom settings. Direct comparisons are therefore not possible. Nonetheless, comparing findings from the present study to findings from past studies helps situate the current results within the cognitive motivation literature. Findings from the current studies will be first related to findings to Bandura and Cervone's (1986) seminal work on cognitive motivation.

Bandura and Cervone's (1986) study examined the differential engagement of all three self-reactive influences in cognitive motivation within the context of a physical task. Performance feedback were manipulated in order to create four performance-goal discrepancy conditions (large substandard (-26% below goal), moderate substandard (-14% below goal), small substandard (-4% below goal), and small suprastandard (+4%

above goal)). In accord with Bandura and Cervone's (1986) study, findings from the current study suggest that future affective self-evaluation operates as the most influential motivator when attainments fall below the pre-set goal. Specifically, anticipated self-dissatisfaction, not self-satisfaction, seems to be a major motivator for students who fail short of their goals. The more self-dissatisfied student reported that they would be if they were to achieve the same grade on Exam 2 than the one received on Exam 1, the more likely they were to report that they would exert higher intended effort toward Exam 2. Similarly and in accord with prediction, self-efficacy toward the attainment of the original goal was a significant motivator. The stronger the students felt that they could still meet their distal goal after receiving their Exam 1 grade, the more likely they were to report higher levels of intended effort. This finding, taken along with findings from previous research that used diverse non-educational tasks (e.g., Bandura & Cervone, 1983, 1986; Cervone & Peake, 1986; Peake & Cervone, 1989), attest for the pervasiveness of the relationship between perceived self-efficacy and motivation.

Findings from the current study suggest that self-set proximal goals are not directly influenced by the magnitude of the performance-goal discrepancy and that they do not exert a direct influence on intended effort. The lack of a direct relationship between the discrepancy and self-set goals was expected in light of the inconsistent and contradicting findings in the literature regarding the influence of performance feedback on goals (e.g., Carver & Scheier, 2000; Donovan & Williams, 2003). Much like Ilies and Judge's (2005) study that showed that affect could mediate a large portion of the relationship between performance feedback and goals, the present study highlights the indirect effects of performance feedback on goals. In the current study, the magnitude of

the negative performance-goal discrepancy did not exert a direct effect on self-set goal, but did exert a significant indirect effect on self-set goals through the two other mediating self-reactive influences (-.115, $p < .001$). The relationship between performance feedback and self-set goals was indirect and mostly mediated by self-efficacy toward the original goal (-.062). Students who retained higher self-efficacy beliefs upon receiving negative performance feedback were more likely to not lower their goal for their next exam.

Even though the lack of a direct relationship between the performance-goal discrepancies and self-set goals was anticipated, the lack of a direct positive relationship between self-set goals and intended effort was not. Higher self-set goals were not linked to higher reported intended effort. The lack of a significant relationship is particularly troubling as most goal theorists (e.g., Latham & Locke, 2006; Locke, 1968; Locke et al., 1984; Locke & Latham, 2002; Tubbs, 1986; Wood et al., 1987) postulate an increasing linear relationship between goal level and effort. Much like in the case of Bandura and Cervone's (1986) large substandard discrepancy condition in which self-set goals spanned over a range too small to allow for the emergence of a relationship, the lack of significant relationship between self-set goals and intended effort could be in part attributed to the lack of variance in self-set goals (Mean = 84.12 out of 100, *SD* = 7.98). In fact, most students (63.2%) set a proximal goal of 80 (29.3% of the students), 85 (12.6% of students) or 90 (21.3% of students). To make the emergence of a significant relationship between self-set goals and intended effort even more difficult, there was also a lack of variance in intended effort (Mean = 6.37 out of 7, *SD* = .88). In fact, 57.2% of participants indicated that they would exert "much more effort" toward Exam 2, a score

of 7 out of 7, and another 27.5% picked a score of 6 out of 7. Thus, additional research is required before strong conclusions can be drawn about the relationship between self-set goals and effort.

The potential absence of a direct positive relationship between self-set goals and intended effort, however, does not mean that the role of goals in cognitive motivation should be dismissed. In fact, the present study suggests that, in the context of academic tasks, the influence of goal setting on effort might not be as straightforward as previously thought of. Goals might play an indirect role on future effort endeavors through their influence on future performance-goal discrepancies. For example, in the context of a class with two midterms (Midterm 1 and Midterm 2) leading to a final exam, a student goal for Midterm 2 set after receiving performance feedback on Midterm 1, might not directly influence effort toward Midterm 2, but might influence effort toward the final exam through its impact on the performance-goal discrepancy for Midterm 2. Stated differently, the goal set for Midterm 2 influences the performance-goal discrepancies of Midterm 2, which in turns directly influence self-evaluation and self-efficacy, which directly influence intended effort toward the next exam, in this case, the final exam.

Taken all together, findings of the present study highlight the mediating and moderating role of self-reactive influences in cognitive motivation. However, while Bandura and Cervone (1986) concluded that the "self-influences operating in concert at particular discrepancy levels explain a substantial amount of the variance in motivation" (p. 92), the present study did not provide as strong of a support for the role of self-reactive influences as predictors of cognitive motivation. For example, in Bandura and Cervone's study (1986), future affective self-evaluation explained 29% ($p < .005$) and

19% ($p < .025$) of variance in effort changes for the large substandard and moderate substandard conditions respectively. In the current study, 5.8% ($p < .001$) of the variance could be attributed to future affective self-evaluation. Similarly, while perceived self-efficacy for the original goal attainment in Bandura and Cervone's study (1986) explained 24% ($p < .01$), 19% ($p < .025$), and 7% ($p < .07$) of the variance in effort change in the case of large, moderate, and small substandard discrepancies respectively, this same variable in the current study explained 1.1% ($p < .01$) of the variance once future affective evaluation was accounted for. Lastly, while self-set goals explained 17% ($p < .05$), 66% ($p < .001$), and 31% ($p < .025$) of the variance in effort change in the case of moderate, small substandard discrepancies in Bandura and Cervone's study (1986), self-set goals failed to account for any additional variance in effort once future affective evaluation and self-efficacy were controlled for.

Achievement Goals as Antecedents to Self-Reactive Influences and Intended Effort

Factorial structure of the achievement goal construct. Before addressing the role of achievement goals in cognitive motivation, it was first important to establish the construct validity of the Achievement Goal Questionnaire - Revised (AGQ-R) among the sample of college students used in the study. Even though the purpose of the present study was not to validate the use of the AGQ-R with a specific sample of undergraduate students, CFA findings would be discussed next as they somewhat differ from the previous literature and challenge previously held assumptions about the relationships existing between all four achievement goals. The following section discusses findings as they relate to the factor structure of achievement goals.

The results of the CFA analysis supported the hypothesized 2 × 2 achievement goal factor structure. However, an examination of the intercorrelations between all four achievement goals highlighted both commonalities and differences with previous research. Much like in Elliot and Murayama's (2008) validation study, goals that shared a common definition (i.e., mastery or performance) were highly correlated. Mastery-approach goals were positively associated with mastery-avoidance goals ($r = .53$, $p < .01$) and, performance-approach goals ($r = .51$, $p < .01$) were positively correlated with performance-avoidance goals ($r = .77$, $p < .01$). Similarly and in accordance with Elliot and Murayama's study, goals that shared a common valence characteristic were also positively correlated. Mastery-avoidance goals were thus highly associated with performance-avoidance goals($r = .52$, $p < .01$), and mastery-approach goals were positively correlated with performance-approach goals ($r = .51$, $p < .01$). However, findings from the current study departed from Elliot and Murayama's findings as goals sharing a common definition dimension (i.e., performance or mastery) were not clearly more closely related than goals sharing a common valence dimension (i.e., approach or avoidance). In fact, in the present study, goals sharing a common valence dimension (mastery-approach and performance-approach ($r = .51$, $p < .01$) as well as mastery-avoidance and performance-avoidance ($r = .52$, $p < .01$) were found to be as highly related than goals sharing a common definition dimension (e.g., mastery-approach and mastery-avoidance goals ($r = .53$, $p < .01$). Further, some goals that shared no common definition or valence dimension were found to positively correlated (e.g., mastery-approach and performance-avoidance goals ($r = .39$, $p < .01$), as well as mastery-avoidance and performance-approach ($r = .34$, $p < .01$). From a conceptual perspective,

it was surprising that these goals were as highly correlated as they were as previous research with college students suggests that these goals are distinct constructs (Elliot & Murayama, 2008; Pintrich 2000b). Table 9 compares achievement goal reliabilities and intercorrelations from the present study with Elliot and Murayama's (2008) AGQ-R validation study.

Table 9

Comparison of Present Results with Elliot and Murayama (2008): Achievement Goal Reliabilities and Intercorrelations

Achievement goal	1	2	3	4
1. Mastery-approach goals	.88 / .84			
2. Mastery-avoidance goals	.53**/ .51**	.84 / .88		
3. Performance-approach goals	.51**/ .16*	.34**/ .15*	.90 / .92	
4. Performance-avoidance goals	.39**/ .13	.52**/ .46**	.77**/ .68**	.88 / .94

Note. Results from the present study are presented before the slash; results from Elliot and Murayama (2008) are presented after the slash. Values in the diagonal represent Cronbach's alphas; values in the remainder of the table are Pearson product moment correlation coefficients. *$p < .05$. **$p < .01$.

The significant intercorrelations among all four achievement goal measures paired with the good levels of internal consistency for all four measures (i.e., Cronbach's alphas) suggest that the four achievement goals are theoretically different, but practically undistinguishable. Stated differently, it appears that all four achievement goals are interrelated in a way that students who reported higher levels of one type of achievement goal are more likely to report higher levels on the other types of goals. Implications of this finding will be discussed in the Implications section. We now turn our focus to the role of achievement goals in cognitive motivation.

Summary and fit of the hypotheses. In general, the findings of the current study indicate that, as hypothesized, achievement goals can explain variance in students' self-reactive influences and intended effort. In fact, the present study offers an explanation for some of the individual differences in all three self-reactive influences. At the exception of one hypothesis (H_{24}) all hypotheses regarding the role of achievement goals in cognitive motivation were confirmed by the hierarchical regression analyses. Additionally, two non-hypothesized significant relationships were uncovered. The following paragraphs describe these findings in further detail.

Mastery-approach goals had a positive direct relationship with intended effort (H_9), perceived self-efficacy toward the original goal (H_{10}), and proximal goal (H_{18}). In addition, these goals moderated the relationships between the negative performance-goal discrepancies and perceived self-efficacy (H_{11}). However, as expected, they were not significantly directly related to future affective self-evaluation (H_{12}) and did not moderate the relationships between performance-goal discrepancies and future affective self-evaluation (H_{14}) and between performance-goal discrepancies and proximal goal (H_{15}).

As hypothesized, mastery-avoidance goals had a positive direct relationship with proximal goal (H_{19}). In addition, a positive direct relationship between mastery-avoidance goals and self-efficacy toward the original goal was uncovered. This relationship was not hypothesized because of the lack of literature regarding the influence of mastery-avoidance goals on self-efficacy beliefs. Mastery-avoidance goals did not have a significant relationship with future affective self-evaluation (H_{13}) and did not moderate the relationship between performance-goal discrepancies and future affective

self-evaluation (H_{16}) and between performance-goal discrepancies and proximal goal (H_{17}).

In accord with prediction, performance-approach goals had a positive direct relationship with proximal goal (H_{25}), but no significant relationship with future affective self-evaluation (H_{23}). Performance-approach goals also moderated the relationship between the performance-goal discrepancies and future affective self-evaluation (H_{20}). Additionally, the present study uncovered a significant positive direct relationship between performance-approach and self-efficacy toward the original goal.

Performance-avoidance goals had, as hypothesized, a positive direct relationship with proximal goal (H_{26}), but no relationship with future affective self-evaluation (H_{23}). These goals also moderated the relationship between performance-goal discrepancies and future affective self-evaluation (H_{21}). Lastly, contradicting predictions, the present study found a significant positive, not negative as expected, direct relationship between performance-avoidance and self-efficacy toward the original goal.

Convergence and divergence with past literature. Previous research has not addressed the mediating and moderating role of achievement goals in cognitive motivation within natural classroom settings. It is thus difficult to compare results from the current study to previous findings. Nonetheless, results from the current study are consistent with previous research that frequently highlights the role of achievement goals on academic motivation variables (e.g., Ames, 1992; Donovan & Swander, 2001; Gutman 2006; Owens, Jaynes, Hamm, & Rawls, 2007; Wolter et al., 1996). Bandura and Cervone (1986) had noted individual differences at each discrepancy level in both perceived self-efficacy and self-set goals measures between individuals. The current

study demonstrates that achievement goals can be used to explain a portion of these individual differences.

The present study suggests that the influence of achievement goals on intended effort is mostly indirect and manifested through their direct effects on self-reactive influences. In fact, only mastery-approach goals had a direct positive relationship with intended effort. In addition to provide support for the body of literature that shows that individuals with a mastery goal orientation are willing to put forth more effort toward mastering a skill than individuals who have a performance goal orientation (e.g., Ames, 1992; Dweck, 1986; Elliot & Dweck, 1988; Meece et al, 1988), this findings suggests that it is important to distinguish mastery goals by their valence dimension (i.e., approach or avoidance) when examining the role of mastery goals on effort. Further, divergent results between performance-approach and performance-avoidance goals indicate that the valence dimension distinction is important to make for both performance and mastery goals when addressing the influence of achievement goals on self-reactive influences. In the remainder of this section, results about the role of each of the four achievement goals on self-reactive influences and intended effort will be discussed.

In regards to the role of achievement goals on future affective self-evaluation, there was no direct relationship between the achievement goals and affective self-evaluation. For each of the four achievement goals and after controlling for the performance-goal discrepancy, students who reported higher achievement goal levels did not differ from students who reported lower levels when it came to their reported dissatisfaction with their subpar performance. However, the presence of interactions between the performance-goal discrepancy and both performance goals (performance-

approach and performance-avoidance) indicates that students with higher performance goals are more sensitive to performance feedback. Their dissatisfaction with their performance was more influenced by the magnitude of the performance-goal discrepancies than their counterparts' with lower performance goals. They were more satisfied with their performance when approximating their pre-set goals for Exam 1 (small discrepancies) and more dissatisfied when missing their goals by a lot (big discrepancies). This finding is consistent with prior research (e.g., Elliot, 1999) that showed that individuals with performance goals have a more extrinsic approach to learning and are therefore more influenced by performance feedback.

Considering the role of achievement goals on self-efficacy, findings were much different than the ones regarding future affective self-evaluation. All four achievement goals did have a positive direct relationship with self-efficacy. After controlling for performance-goal discrepancies, higher goals were linked to higher levels of self-efficacy. The positive direct relationships between mastery goals (mastery-approach and mastery-avoidance) and self-efficacy corroborated findings from the attributional literature that demonstrated the link between mastery goals, adaptive attributions and self-efficacy beliefs. That is, because students who adapt mastery goals are more prone to attribute their failure to low effort or poor strategies rather than to low ability, they are more likely to retain high self-efficacy beliefs (Ames, 1992; Kaplan & Midgley, 1997; Middleton & Midgley, 1997; Pintrich & Schunk, 1996; Wolters et al., 1996). Stated differently, following negative performance feedback, students with high mastery goals tend to believe that their effort could still allow them to achieve their original distal goal for the course. Additionally, for students with high mastery-approach goals, it appears

that the magnitude of the performance-goal discrepancy does not have much of an effect on their self-efficacy beliefs. As evidence by the interaction between mastery-approach goals and the performance-goal discrepancy, students with mastery goals retain high levels of self-efficacy beliefs regardless of the gap between their performance and their pre-set goal.

Findings concerning the relationships between performance goals and self-efficacy suggest that performance goals, like mastery goals, foster self-efficacy beliefs. Because of the inconsistent and contradictory findings in the literature, no relationship was hypothesized between performance-approach goals and self-efficacy. Nonetheless, a positive relationship was identified between these two variables in the present study. This finding contributes to the body of research that suggests a positive link between performance-approach goals and self-efficacy (Anderman & Midgley, 1997; Pajares et al., 2000; Skaalvik, 1997; Wolters et al., 1996). The positive relationship between performance-avoidance goals and self-efficacy was however particularly surprising as previous studies had found performance-avoidance goals to be negatively related to self-efficacy (Middleton & Midley, 1997; Pajares et al., 2000; Skaalvik, 1997). In the current study, the more students reported to be motivated by the fear of not performing as good as their peers, the more they felt confident that they could still achieve the course goal that they had set for themselves at the beginning of the semester. At first glance, this finding seems illogical as it could be expected that students with low self-efficacy beliefs would be students who are afraid to not perform as good as other students. However, a closer look at the significant positive high correlation existing between performance-avoidance goals and performance-approach goals ($r = .86$, $p < .01$) suggests that the

positive relationship between performance-avoidance goals and self-efficacy might have been caused by the presence of performance-approach goals as a confounding factor. Stated differently, because students with high performance-avoidance goals also tend to have high performance-approach goals, they might retain high self-efficacy beliefs upon negative performance feedback because of the positive influence of their performance-approach goals on self-efficacy, and not because of their performance-avoidance goals. Additional research is required to disentangle the effects of performance-avoidance goals from performance-approach goals.

Considering the role of achievement goals on proximal goals, findings were similar to the ones regarding self-efficacy. All four achievement goals did have a positive direct relationship with proximal goals. After controlling for performance-goal discrepancies, higher goals were linked to higher levels of proximal goals. Results suggest that students with higher mastery goals set higher goals for themselves in order to motivate themselves to either learn as much as possible (i.e., students with mastery-approach goals) or to avoid not learning as much as possible (i.e., students with mastery-avoidance goals). These findings highlight that just because students with high mastery goals are not inclined to be focused on external rewards that this does not mean that they do not care about their grades. For such students, achieving good grades is in sort a natural byproduct, not the end goal. Similarly to students with high mastery goals, students with high performance goals appear to set higher proximal goals for themselves. However, their motivation to do so is to demonstrate their ability to others. For such students, learning is a means to the end of appearing good compared to others (i.e.,

students with performance-approach goals) or not looking bad compared to others (i.e., students with performance-avoidance goals).

It is interesting to note that even though all four achievement goals had a positive relationship with proximal goal, the approach goals (i.e., mastery-approach and performance-approach) had a stronger relationship with the self-reactive influence. This finding might have been in part precipitated by the fact that students with approach goals, who are more promotional, fear less about not achieving their proximal goal and therefore do not have any reasons to lower their proximal goal. On another hand, students with avoidance goals might have been reluctant to set higher goals for themselves because they fear that they might not be able to achieve those. Further, results from the present study suggest that performance-approach goals exert the most positive effects on proximal goal. Similar results were found for the influence of performance-approach goals on self-efficacy. Combined together, these results support findings from previous research that highlight the positive role of performance-approach goals in competitive learning environments (e.g., Midgley et al., 2001).

Implications of Findings

Several theoretical, empirical and practical implications can be drawn from the present research. These are discussed in the paragraphs below.

Theoretical and Empirical Implications

Cognitive motivation. The discrepancies between the current study and previous research on cognitive motivation raise questions about the generalizability of findings derived from studies that have not been conducted in academic settings. Results from the current study suggest that, in academic settings, students use self-reactive influences

differently than in non-academic settings. Further, it appears that the role of self-reactive influences on student cognitive motivation might have been overestimated. These findings might have been precipitated by the fact that, as opposed to previous studies (e.g., Bandura & Cervone, 1983; 1986; Cervone et al., 1991), students in the current study work toward academic tasks, set their own goals, and received real performance feedback. Taken together, findings from the present research provide preliminary support for conducting future studies within natural classroom settings before drawing any final conclusions regarding the role of self-reactive influences in student cognitive motivation.

From an empirical standpoint, the present research provides support for the use of methods beyond simple correlation analyses when examining the role of self-reactive influences on cognitive motivation. The use of a path model analysis uncovered significant relationships between self-reactive influences and intended effort that a correlational study might have overlooked. For instance, the correlation between self-efficacy toward the original goal and intended effort (r = .32) in the present study was not significant and one might have concluded that self-efficacy was not linked to intended effort. However, the present study path model analysis uncovered that self-efficacy toward the original goal had a significant positive direct (.129, $p < .01$) and total effect (.119, $p < .01$) on intended effort. These seemingly contradicting results highlight the advantages of using methods such as path model analyses that control for various variables. In the present study, for instance, the positive effects of self-efficacy on intended effort were uncovered only because the negative effects of future affective self-evaluation were controlled for.

Achievement goal theory. The present study concluded that the four achievement goals are theoretically different, but practically undistinguishable due to the high inter-correlations between all four goals. Thus, from a theoretical and empirical perspective, it is not coherent to focus on a main goal "orientation" for each individual. In fact, in the present study, only 48.5% of the participants (219 out of 451 participants) reported a higher score on one of the four achievement goals. Further, for many of these students, their second highest level of achievement goals only minimally differed from their highest goal. From an empirical perspective, the fact that achievement goals are highly intertwined implies that researchers might have difficulty disentangling the effects of each achievement goal when examining the influence of achievement goals on academic measures. Theorists and researchers alike might therefore be better served to look at achievement goals from a goal profile perspective.

Applied Implications for Educators

Cognitive motivation. The study highlighted some interesting findings which, if replicable and generalizable, will shed more light on cognitive motivation and therefore help develop more successful motivation techniques. In particular, three main results appear relevant to educators interested in fostering their students' cognitive motivation.

First, student self-dissatisfaction with future substandard grades was a major influence on intended effort in the case of negative performance-goal discrepancies. The more dissatisfied students reported they would be if they were to receive the same substandard grade on their next exam, the more likely they were to report higher levels of subsequent intended effort. To this effect, focus should be given to strategies aimed at preventing students' complacency with substandard grades. Educators should therefore

not attempt to assuage their students' future dissatisfaction for substandard performances, because negative feelings seem to serve as motivators.

Second, student self-efficacy beliefs also played an important role on intended effort. In this respect, attention should be given to techniques that promote students' self-efficacy. In this respect, research has consistently demonstrated that learning environment and teaching strategies can and impact students' self-efficacy (Bandura, 1977; Fencl & Scheel, 2005). In particular, past mastery experiences, vicarious experiences, verbal persuasion and physiological factors have been shown to play a crucial part in affecting students' self-efficacy (Bandura, 1977). In the case of struggling students, several teaching methods have been showed to improve students' self-efficacy. Among them are the uses of moderately-difficult tasks, peer models, specific encouragements, and personalized feedback (Margolis & McCabe, 2006). With such students, teachers could also boost self-efficacy by teaching specific learning strategies, capitalizing on students' interest, allowing students to make choices to promote self-efficacy, and encouraging accurate attributions for failure (Margolis & McCabe, 2006). Such techniques have already been used and successfully implemented in several programs and labs. For example, the P20 Motivation and Learning Lab, co-directed by Dr. Ellen Usher from the University of Kentucky and Meribeth Gaines, principal of Wellington Elementary School in Fayette County, focuses on student motivation and highlight the critical role of self-efficacy (P20 Motivation & Learning Lab, 2012).

Lastly, the third finding from the current study that is particularly relevant to educators interested in promoting their students' cognitive motivation is that student future dissatisfaction was negatively correlated with student self-efficacy. Thus,

techniques aimed at avoiding students' complacency with substandard grades should also make sure that they do not also negatively impact student self-efficacy. One way to achieve this outcome might be for educators to acknowledge their students' negative feelings following negative performance feedback as being legitimate while at the same time persuading students that they can still achieve their goal on future academic tasks. Combined, these three findings provide support for an authoritative teaching style (Baumrind, 1971) in which educators promote high standards and provide high support to their students to achieve such standards.

Achievement goal theory. In the present study, mastery-approach goals were the only type of goals to have a direct relationship between self-efficacy, proximal goal and intended effort. As previous studies have suggested that teacher beliefs and practices contribute to classroom goal structure (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001) and that the classroom goal structure perceived by students contributes to their personal goal orientations (Anderman, Maehr, & Midgley, 1999; Midgley et al., 1995), teachers could therefore indirectly influence their students' achievement goals and ultimately cognitive motivation through self-reactive influences. Educational policies and programs influencing teacher beliefs and practices could be implemented to indirectly promote more adaptive students' achievement goals, such as mastery-approach goals.

Limitations of Study

Design and Internal Validity

The statistical methods used in the current study allowed the researcher to test the main hypotheses that the self-reactive influences mediate the effects of the negative

performance-goal discrepancies on intended effort; and that achievement goals influence intended effort in the context of negative performance-goal discrepancies through their main effects on self-reactive influences and intended effort, and their moderating effects on the relationship between the discrepancy and the self-reactive influences. However, it is important to recognize that even though the chosen method design fit the purpose of the study, the present study has several limitations that must be acknowledged.

Maybe the biggest limitation, given the study design, is the inability to make strong causal inference. Path model analyses highlight relationships between variables, but do not imply strong causation. For example, while higher self-efficacy toward the original goal appeared to lead to higher intended effort, it could be that higher intended effort reported by the student causes his or her self-efficacy toward the original goal to increase. Therefore, a need exists for further research to confirm the results and make definitive statements about causation. For instance, future studies could, in addition to measure self-reactive influences following performance-feedback, attempt to capture subsequent actual student effort by measuring the time students spend studying materials for the class.

Another limitation of the study design is that the effects of each of the four achievement goal types cannot be easily distinguished from each other. Because most students had more than one type of goals driving their motivation, it was not possible to divide participants based on a primary goal orientation. All four achievement goals were significantly related. Thus, the relationships between each achievement goal and self-reactive influences as well as each achievement goal and intended effort need to be

interpreted with caution as they might have been confounded by the other achievement goals.

External Validity and Generalizability

While the current study sheds more light on college students' cognitive motivation, findings might not be generalizable to all students as our sample consisted of mostly Caucasian college students from a university located in an urban area in a mid-sized southern U.S. city. Additional research examining students in various developmental stages (e.g., middle school, high school) and various settings (e.g., rural settings, other countries) is therefore necessary before drawing final conclusions about the role of self-reactive influences and achievement goals in cognitive motivation.

Future Directions and Conclusion

College student cognitive motivation is difficult to assess given the limited amount of studies conducted in natural academic settings. The current study aimed to bridge this gap by exploring the relationships that exist within actual educational settings between negative performance-goal discrepancies, achievement goals, self-reactive influences and, intended effort with a large sample of undergraduate students. While the current study provides preliminary evidence to inform educators and researchers about the role of self-reactive influences and achievement goals on cognitive motivation, additional research should be conducted in academic settings before drawing final conclusions.

As the present study focused on cognitive motivation in the context of negative academic performance feedback with a sample of primarily Caucasian undergraduate students taking classes at a Southern U.S. university located in an urban area, findings

might not be generalizable to all students. In addition to conducting research with students in various developmental stages (e.g., middle school, high school) and from different settings (e.g., rural areas, private schools, different countries), additional research investigating the role of self-reactive influences and achievement goals in the context of positive academic performance feedback is necessary in order to achieve a more comprehensive picture of student cognitive motivation. Future studies examining cognitive motivation following positive performance feedback might for instance uncover that the order of importance of the self-reactive influences on effort is reversed in the case of positive performance-goal discrepancies.

Related to the role of self-reactive influences in cognitive motivation, the present study examined the mediating role of self-reactive influences. Future studies could further investigate the role of self-reactive influences in cognitive motivation by including the potential moderating effects of such variables. Bandura and colleagues (Bandura, 1995; Bandura & Cervone, 1983) have already showed that self-efficacy beliefs are likely to moderate the relationship between negative performance feedback (i.e., negative performance-goal discrepancies) and self-set goal. Future studies could add to this line of research by examining for example, the moderating role of future affective self-evaluation on the relationship between negative performance feedback and self-efficacy.

In the present study, singles items were used to measure the self-reactive influences. This methodology was, in part, chosen because of the limited time allocated during class time to collect data. Future research could however use multiple items to create latent or composite variables to measure self-reactive influences and effort. Future

studies could also attempt to measure actual effort exerted toward academic goals instead of using reported intended effort as a measure of cognitive motivation. However, it would be a challenge to measure actual student effort without influencing the natural classroom environment. It would also be interesting to compare student intended effort with student actual effort as well as to link effort to academic performance.

In relation to the role of achievement goals in cognitive motivation, the present study examined the moderating role that achievement goals play on the relationship between the performance-goal discrepancies and self-reactive influences. Future studies could address the moderating role that achievement goals exert on the relationship between self-reactive influences and effort. Further, beside achievement goals, future studies could investigate the role of other motivation measures in cognitive motivation. For instance, researchers could explore the role of students' self-concept, attributional beliefs and mindset on students' cognitive motivation. Examining such variables would account for additional variance that exists between students' self-reactive influences and effort measures.

Future research could also use longitudinal designs to track student motivation over longer periods of time. As previously mentioned, the vast majority of students in the present study reported high levels of cognitive motivation. It might be the case then, that students who fall short of their goal have a tendency to report high levels of cognitive motivation upon receiving performance feedback. Future research could examine whether cognitive motivation remains high after more time expires after performance feedback. Longitudinal studies could also examine how self-reactive influences and personal factors such as achievement goals change across the course of a semester, a

school year or several years of school. Investigating students' cognitive motivation over longer periods of time could determine how students' achievement goals, self-reactive influences and effort change as students progress from proximal goals to more distal academic goals across the course of a semester.

Lastly, additional research could advance achievement goal theory. The current study discusses the role of the four different achievement goals separately and focuses on the main and moderating effects of each of these goals. However, as the high correlations between achievement goals indicate, it possible for students to adopt multiple achievement goals for academic tasks. Few correlational studies (e.g., Wolters et al., 1996) examined the potential interactions between the different goals, but did not return any substantial results. There is a need for additional research exploring the potential interactions between goals. It might be that students are able to switch between different goal orientations within a task using dynamic cognitive processes (Shah & Kruglanski, 2000) that could lead to various effects on cognitive motivation. Thus, future research could investigate a hierarchy or a profile of goal orientations.

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Appendix A: Subject Consent Form

SUBJECT CONSENT FORM FOR

PARTICIPATION OF HUMAN SUBJECTS IN RESEARCH

The University of Memphis

Project Title:	Dissertation: Goals in education
Researcher:	Caroline Hart, cohart@memphis.edu
Dissertation Chair:	Dr. Mueller, College of Education The University of Memphis, Memphis, TN 38152 cemuellr@memphis.edu

My name is Caroline Hart. I am a Doctoral Candidate in the College of Education at the University of Memphis. I am collecting data for my dissertation via questionnaires.

If you agree to participate in this study, you will be asked to complete questionnaires at multiple times during the spring 2010 semester (at the beginning of semester and after you receive your grade on each of your major test (final test not included)). It should only take about 10 minutes to complete each questionnaire. The kind of information collected will regard your attitude prior and after tests.

This project has been approved through the IRB process at the University of Memphis. That basically means that you will not be harmed in any way by participating in this project. Your identity will not be revealed. Your name will not be collected on the questionnaires. Information will be kept confidential within the limits allowed by law. Data collected in this study will not be shared with your professor.

If you have any concerns regarding your selection for this study or about the questionnaires, you may contact Caroline Hart at (901) 767-8225 or via email at cohart@memphis.edu. If you have any concerns regarding the research subjects' rights, you may contact the Chair of the Institutional Review Board for the Protection of Human Subjects at (901) 678-2533.

By signing your name below, you are indicating that you have read the information provided above and have decided to participate. Your participation is voluntary. You have the right to refuse to participate and you may withdraw from participation for any reason and at any time during the study with no coercion or prejudice.

Signature: _____

By signing your name below, you are allowing me to ask your professor to release your grades to me once the semester is over. Your name will not be linked to the grades.

Signature: _____

Thank you for your time and consideration.

Appendix B: Questionnaire 1

ID: _____ (Use the last 4 digit of your SSN)

1. **What is your gender?**
   - O Male
   - O Female

2. **What is your ethnicity?**
   - O Caucasian
   - O African American
   - O Hispanic
   - O Asian, Pacific Islander
   - O Native American, Alaska Native
   - O Other: (specify) _____

3. **How old are you?** _____

4. **What is your academic college/school?**
   - O College of Arts and Sciences
   - O Fogelman College of Business and Economics
   - O College of Communication and Fine Arts
   - O College of Education
   - O Herff College of Engineering
   - O School of Audiology and Speech-Language Pathology
   - O Cecil C. Humphreys School of Law
   - O Loewenberg School of Nursing
   - O University College
   - O Other: (specify) _____

5. **What is your class standing?**
   - O Freshman
   - O Sophomore
   - O Junior
   - O Senior
   - O Other Please specify: _____

6. Please indicate the extent to which you agree with each item on a 1 (strongly disagree) to 5 (strongly agree) scale. (Circle the numbers that best apply to you)

	strongly disagree				strongly agree
a) My aim is to completely master the material presented in this class.	1	2	3	4	5
b) I am striving to do well compared to other students.	1	2	3	4	5
c) My goal is to learn as much as possible.	1	2	3	4	5
d) My aim is to perform well relative to other students.	1	2	3	4	5
e) My aim is to avoid learning less than I possibly could.	1	2	3	4	5
f) My goal is to avoid performing poorly compared to others.	1	2	3	4	5
g) I am striving to understand the content of this course as thoroughly as possible.	1	2	3	4	5
h) My goal is to perform better than the other students.	1	2	3	4	5
i) My goal is to avoid learning less than it is possible to learn.	1	2	3	4	5
j) I am striving to avoid performing worse than others.	1	2	3	4	5
k) I am striving to avoid an incomplete understanding of the course material.	1	2	3	4	5
l) My aim is to avoid doing worse than other students.	1	2	3	4	5

On the following two questions, you will be asked to report a <u>numerical</u> grade (example: 92). DO NOT REPORT A LETTER GRADE!

7. Please report your <u>minimum satisfactory</u> numerical grade for: DO <u>NOT</u> REPORT THE LETTER GRADE.

a) the upcoming exam (Exam 1) in this class: _____ (numerical grade)

b) the overall course grade for this class: _____ (numerical grade)

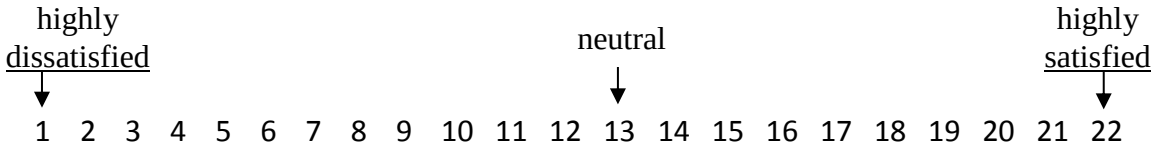
THANK YOU FOR TAKING THE TIME TO FILL IN THE QUESTIONNAIRE.
YOUR PARTICIPATION IS GREATLY APPRECIATED.

Appendix C: Questionnaire 2

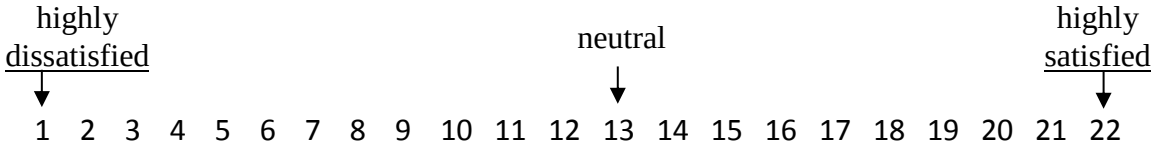
ID: _____ (Use the last 4 digit of your SSN)

1. Please report the <u>numerical grade</u> (NOT the letter grade) you have received on your exam (Exam 1): _____

2. Indicate how dissatisfied or satisfied you are with your Exam 1 grade (the one reported in question 1) **using the following scale.**



3. Indicate how dissatisfied or satisfied you will be if you were to achieve the same grade on your next exam (Exam 2).



4. Rate how confident you are that you can achieve the minimum satisfactory overall course grade you set for yourself <u>at the beginning of this course</u>. Rate your degree of confidence by recording a number from 0 to 100 using the scale given below:

Cannot do at all — Moderately certain can do — Highly certain can do

0 10 20 30 40 50 60 70 80 90 100

5. Please report your <u>minimum satisfactory</u> numerical grade for:

DO <u>NOT</u> REPORT THE LETTER GRADE.

a) the upcoming exam (Exam 2) in this class: _____ (numerical grade)

b) the overall course grade for this class: _____ (numerical grade)

6. Rate how confident you are that you can achieve the minimum satisfactory grade you've just set for yourself for your next exam (Exam 2) in Question 5a. Rate your degree of confidence by recording a number from 0 to 100 using the scale given below:

Cannot do at all					Moderately certain can do					Highly certain can do
0	10	20	30	40	50	60	70	80	90	100

7. Rate how confident you are that you can achieve the minimum satisfactory overall course grade you've just set for yourself in Question 5b. Rate your degree of confidence by recording a number from 0 to 100 using the scale given below:

Cannot do at all					Moderately certain can do					Highly certain can do
0	10	20	30	40	50	60	70	80	90	100

8. Indicate how much effort you intend to put toward the <u>next</u> exam (Exam 2).

much less effort			same effort			much more effort
1	2	3	4	5	6	7

THANK YOU FOR TAKING THE TIME TO FILL IN THE QUESTIONNAIRE.

YOUR PARTICIPATION IS GREATLY APPRECIATED.

Appendix D: Items for the Achievement Goal Questionnaire-Revised (AGQ-R)

Items for the Achievement Goal Questionnaire-Revised (AGQ-R)

Item	Item content
	Mastery-approach goal (MAP) items
1	My aim is to completely master the material presented in this class (MAP1)
3	My goal is to learn as much as possible (MAP2).
7	I am striving to understand the content of this course as thoroughly as possible (MAP3).
	Mastery-avoidance goal (MAV) items
5	My aim is to avoid learning less than I possibly could (MAV1).
9	My goal is to avoid learning less than it is possible to learn (MAV2).
11	I am striving to avoid an incomplete understanding of the course material (MAV3)
	Performance-approach goal (PAP) items
2	I am striving to do well compared to other students (PAP1).
4	My aim is to perform well relative to other students (PAP2).
8	My goal is to perform better than the other students (PAP3).
	Performance-avoidance goal (PAV) items
6	My goal is to avoid performing poorly compared to others (PAV1).
10	I am striving to avoid performing worse than others (PAV2).
12	My aim is to avoid doing worse than other students (PAV3).

Note. The present study used the same items order than the one used by Elliot and Murayama (2008).