

EXPLAINING DISCREPANT FINDINGS FOR
PERFORMANCE-APPROACH GOALS:
THE ROLE OF EMOTION REGULATION DURING TEST TAKING

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Dissertation submitted in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy in the
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ABSTRACT

The study of achievement goals has begun to examine the underlying mechanisms that link goal orientations in order to develop a more accurate model that explains achievement outcomes. Currently, performance-approach goal orientations are inconsistently linked to affective, cognitive, and behavioral outcomes. Little research has considered the underlying mechanisms that sustain performance-approach goal orientations, particularly for early adolescents. This study explores the ways in which adolescents modify or regulate the emotional experiences that can interfere with or enhance the attainment of performance-approach goals and achievement. As such, this dissertation examined the role of emotion regulation as a critical process in the pursuit of performance-approach goal orientations that explains how individuals can modify their emotional experiences in order to achieve in a middle school sample ($N=328$). Students completed self-report measures of their goal orientations and other background variables. After taking a unit math exam, students reported on the emotions that they experienced during the exam. Structural equation modeling was used to examine associations among student goals, emotional experiences, strategies for regulating emotions, and math achievement. Results demonstrated evidence that emotion regulation strategies moderated the relation between performance-approach goals and achievement on a math test. The study found partial support for the PARE model, indicating that performance-approach goals are associated with achievement outcomes when students experience debilitating emotions and utilize emotion regulation strategies.

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Table of Contents

	<u>Page</u>
Abstract.....	iv
Acknowledgements.....	v
List of Tables	x
List of Figures	xi
Introduction.....	1
Theoretical Background: Achievement Goal Theory	4
Self-Theories/Implicit Theories of Intelligence.....	5
Defining Ability & the Role of the Ego.....	7
Context Matters.....	8
Approach and Avoidance Distinction.....	12
Relation between Achievement Goal Orientations and Outcomes.....	14
Socialization of Achievement Goals.....	18
Parenting and Achievement Goal Orientation	18
Classroom & School Goal Context.....	23
Ethnicity.....	26
Intelligence, Praise, and the Role of Performance Goal Environments for African American Students	27
Environmental Influence.....	28
Socialization Summary	29
Multiple Goals Perspective	29
Goal Theory Debate.....	31
Attempts to Resolve Inconsistent Findings for Performance-Approach Goal Orientations.....	36

Table of Contents
(continued)

	<u>Page</u>
Achievement Goal Orientations and Emotional Responses	37
Emotion Regulation	40
Self-Regulation as a Multi-faceted Construct.....	40
Defining Emotion Regulation.....	42
Development of Emotion Regulation	43
Characterization of Emotion Regulation	44
Individual Differences in Emotion Regulation.....	48
Distinctions among Sub-Disciplines.....	50
Commonalities	51
Regulating Debilitating Emotions in Academic Contexts.....	52
Interaction: Emotion Regulation and Performance-Approach Orientations.....	57
Emotion Regulation and Achievement Goal Orientations	57
Theoretical Model & Research Questions: Performance-Approach and Regulation of Emotion Model (PARE)	60
Consideration of Socialization Processes	60
Collective Effects of Home and School Orientation	65
Home/School Dissonance	65
Protective Influence of Home or School.....	67
Personal Goal Orientations and the Impact on Emotional Responding and Achievement	69
Pilot Study: Testing the Right Portion of the PARE Model	73
Overview & Premise of Research Design	73

Table of Contents
(continued)

	<u>Page</u>
Preliminary Evidence.....	74
Implications for Testing the Proposed Model.....	79
Hypotheses.....	82
Dissertation: Research Design and Methods	84
Overview: Proposed Research	84
Recruitment, Rationale, & Participant Selection Criteria.....	85
Procedure	87
Self-Report Instruments	88
Analytic Strategy	94
Data Preparation	94
Missing Data.....	95
Estimating the Measurement Model.....	95
Model Respecification: Alternative and Equivalent Models.....	96
Estimating the Structural Paths.....	96
Method of Estimation	100
Results.....	101
Measurement Model	101
Measurement Model: Motivational Variables	101
Measurement Model: Emotion Regulation Strategies during Test-Taking	105
Measurement Model: Teacher Rating of Emotion Regulation.....	106
Grade Level Analyses.....	107
Structural Models.....	109

Table of Contents
(continued)

	<u>Page</u>
Grade Level & Ethnicity as Potential Moderators	116
Discussion	118
Limitations	127
Future Directions	129
Policy Implications	130
Conclusion	131
References.....	153
Biography.....	165

List of Tables

	<u>Page</u>
Table 1. Descriptive Statistics for the Study Sample.....	132
Table 2. Descriptive Statistics for Primary Study Variables	133
Table 3. Standardized Factor Loadings for Performance Goal Constructs	134
Table 4. Standardized Factor Loadings for Theories of Intelligence.....	135
Table 5. Standardized Factor Loadings for Debilitating Emotions	136
Table 6. Standardized Factor Loadings for Emotion Regulation Items.....	137
Table 7. Standardized Factor Loadings for Teacher Reported Student Emotion Regulation	139
Table 8. Estimated Correlations among Latent Variables	140
Table 9. Model Fit Indices for Structural Models.....	141

List of Figures

	<u>Page</u>
Figure 1. Conceptual Model: PARE Model – Performance-Approach and Regulation of Emotion.....	142
Figure 2. Overall Structural Model.....	143
Figure 3. Test-taking Strategies, Activated Debilitating Emotions, & Test Grade	144
Figure 4. Interaction between Performance-Approach Goals and Self-Blame.....	145
Figure 5. Performance-Approach Goals and Importance Reappraisal	146
Figure 6. Three-way Interaction between Performance-Approach Goals, Anxiety, & Wishful Thinking	147
Figure 7. Test-taking Strategies, Activated Debilitating Emotions, & Final Grade	148
Figure 8. Test-taking Strategies, Deactivated Debilitating Emotions, & Test Grade.....	149
Figure 9. Test-taking Strategies, Deactivated Debilitating Emotions, & Final Grade ...	150
Figure 10. Teacher-Rated Emotion Regulation, Activated Debilitating Emotions, & Test Grade.....	151
Figure 11. Teacher-Rated Emotion Regulation, Deactivated Debilitating Emotions, & Final Grade.....	152

INTRODUCTION

As early adolescents transition from elementary school to middle school, they are confronted with an array of changes in their academic environment. Whereas elementary school predominantly encourages students to acquire new skill sets and learn foundational concepts, middle school environments tend to become more heavily focused on achievement outcomes as evaluative measures such as grades, test scores, and ability grouping increase in prevalence and importance (Blackwell, Trzesniewski, & Dweck, 2007; Maehr & Anderman, 1993). In turn, middle school environments can become increasingly competitive, particularly as students become more attentive to their peers and use social comparison to readily index their own achievement relative to other students. Similarly, in the home environment, parents can also send messages about the importance of academic success for future goals. Naturally, due to the abundance of messages about the importance of academic success, students in middle school are often identified by their achievement and begin to embrace their academic competence (or lack thereof) as a critical component of their identity (Harter, Bresnick, Bouchev, & Whitesell, 1997).

Amidst these developmental and contextual changes, early adolescents are at risk for experiencing a decline in both motivation and classroom grades (Eccles, Lord, & Midgley, 1991; Eccles, Wigfield, Reuman, MacIver, & Feldlaufer, 1993). Even more troublesome, those students who have previously experienced problems with school are at risk for future academic difficulty (Maehr, 1993), which often creates both stress and negative emotional experiences (Kaplan & Midgely, 1999). As such, the climate of middle school may be especially likely to induce emotional experiences that can interfere

with student motivation and achievement outcomes. Because students' emotions are linked to their academic outcomes (Boekaerts, 1993; Kaplan & Midgley, 1999; Linnenbrink & Pintrich, 2002; Pekrun, Elliot, & Maier, 2006; Revelle & Loftus, 1990; Schutz & Davis, 2000), it is important to identify the processes that students use to reduce potentially debilitating emotional experiences and overcome academic challenges.

As a theoretical lens for examining these questions and processes, achievement goal theory may be especially beneficial because it explains the processes involved when students adopt the goals reinforced in middle school environments. Often, middle schools encourage students to prove their academic ability, demonstrate their competence, and ultimately, prove their intelligence. Indeed, achievement goal theory has emerged as a prominent model of achievement motivation because it explains how the goals students adopt can influence their achievement in classroom contexts (Pintrich, 2003). Although the conceptual tenets of this model propose distinct patterns of achievement outcomes for students focusing on mastery¹ orientations (emphasis on developing competence) and performance orientations (emphasis on demonstrating competence), the empirical evidence fails to find a consistent pattern of results.

Whereas the achievement goal theory literature has historically considered the role of emotional experiences for goal orientations (Dweck & Wortman, 1982; Weiner, 1985), less attention has been paid to the ways in which individuals modify or regulate the emotional experiences that can interfere with their goals. As such, this dissertation

¹ For the purposes of consistency throughout this paper, the classification *mastery goal orientation* (Ames, 1984) will be used in place of *learning goal* and *task goal orientations*, and *performance goal orientation* will be used in place of *ego-involved goals* and *ability goals* as these are the current predominating terms used in the achievement goal literature.

will examine the role of emotion regulation as a moderator that explains the inconsistencies in academic outcomes for students pursuing performance-approach goals.

THEORETICAL BACKGROUND: ACHIEVEMENT GOAL THEORY

Achievement goal theory provides a framework for interpreting and reacting to events (Dweck & Leggett, 1988). Goals are the cognitive representations of a child's purpose in achievement situations. This theory is not only concerned with the goal itself, but also with the concomitant factors that cause someone to pursue that particular goal and develop an orientation for approaching or avoiding that goal in the future (Linnenbrink & Pintrich, 2000). Achievement goal theory emphasizes the mental representations of the way in which students approach and avoid their goals. The general social cognitive perspective postulates that achievement motivation is mediated by self-reflective and self-directive processes.

Achievement goal theory makes a crucial distinction between two types of goal orientations: performance and mastery. Performance goal orientations indicate that the individual's primary objective in the context of achievement is to demonstrate one's competence (Nicholls, 1984) and/or avoid looking incompetent (Dweck & Wortman, 1982). A critical feature of performance goals is the fact that they are purported to take three established forms: (a.) goals that are linked to validating one's ability (i.e., demonstrating that one is smart), (b.) goals contingent upon social comparison (i.e., wanting to perform better than others) (Nicholls, 1984; 1990), and (c.) goals that are simply focused on doing well² (Grant & Dweck, 2003). Whereas the first two conceptualizations can be harmful for student achievement because they emphasize the

² Goals that are simply focused on doing well have also been termed extrinsic goals because they are focused purely on external indicators of achievement. These may be different from performance goals which place an emphasis on the self.

self, the third component can be a positive force because it emphasizes extrinsic factors (Anderman, Griesinger, & Westerfield, 1998; Murdock, Hale, & Weber, 2001).

Alternatively, mastery goals indicate that an individual's primary objective is to develop competence by improving upon one's skills (Nicholls, 1984; Dweck, 1986; Dweck & Leggett, 1988). Students with a mastery goal orientation tend to select and persist at challenging tasks because they view effort as a way to attain new skills. They are more likely to make internal attributions for success ("I did well because I worked hard") and external attributions for failures ("The test was unfair, but I'll do better if I try harder") (Dweck, 1986). Indeed, across several experimental studies, students exposed to mastery oriented environments opted for challenging tasks and responded to failure by expending more effort on future tasks (Elliott & Dweck, 1988; Mueller & Dweck, 1996; Kamins & Dweck, 1999; Grant & Dweck, 2003).

Self-Theories/Implicit Theories of Intelligence

In an attempt to discover why individuals would pursue different achievement goals, researchers began to examine social-cognitive processes that elicit goal pursuit. One of the most widely documented attempts to identify these processes has been made in the literature on implicit theories, which draws from the attribution theory research. The implicit theories perspective posits that different theories about the self orient individuals toward achievement goals (Dweck & Leggett, 1988). These implicit theories include entity and incremental views of intelligence. An entity theory endorses the idea that intelligence is a stable quality that cannot be changed. This belief has been associated with performance goal orientations because it causes individuals to focus on demonstrating their ability, either by gaining positive judgments or avoiding negative

judgments of one's competence (Dweck, 1986; Grant & Dweck, 2003). Alternatively, an incremental view of intelligence is the belief that intelligence is a malleable quality that can be improved with effort. Since incremental views endorse the idea that ability can be developed, they are often associated with mastery goal orientations (Elliott & Dweck, 1988).

Theories of intelligence are purported to follow a distinct developmental pattern, starting between ages 7 and 8. According to this perspective, young children do not have stable views of intelligence or ability. Rather than define themselves in terms of ability, young children in pre-school and kindergarten use the concepts of "goodness" and "badness" to identify themselves across multiple domains, such as their behavior and academic efforts (Dweck, 2002). In the U.S. between the ages of 7 and 8, children begin to view ability as a trait that may be consistent over time and that may predict future behavior and performance. Although this view of ability emerges, elementary school age children generally tend to endorse incremental views of intelligence because they often define ability as an unstable trait rather than an internal quality (Dweck, 2002). These findings lend credence to the notion that incremental theories of intelligence are associated with the development of mastery goal orientations (Dweck, 2002; Mueller & Dweck, 1998). Indeed, mastery goal orientations are most prevalent in early elementary school (see Linnenbrink & Fredericks, 2007 for a review).

However, during the transition to middle school, there appears to be a developmental shift during which children ages 10 to 12 begin to understand ability as a potentially stable trait and define it as such. At this time, students begin endorsing entity views of intelligence and performance goal orientations (Dweck, 2002). In addition,

students in early middle school begin to choose performance goals as opposed to mastery goals. This developmental shift toward the stable view of ability is thought to follow the general shift in goal environments as middle school contexts become increasingly focused on social comparison and student performance relative to peers.

Defining Ability & the Role of the Ego

Using attribution theory as a framework for exploring the use of achievement goals, other researchers challenged the notion that effort and ability are concepts that are defined in the same manner for younger and older children (Nicholls, 1990). According to theories of intelligence, children define ability as either stable or unstable, depending upon their age (Dweck, 2002). However, developmental differences have been found when researchers acknowledge alternative ways in which children define ability (Nicholls, 1990; see Kinlaw & Kurtz-Costes, 2003 for a review).

According to the developmental perspective of the nature of children's attributions, Nicholls (1979) demonstrated that rather than defining ability across the dimensions of stable/unstable, children make logical attributions about ability. Children can define ability as one's capacity relative to other people (Nicholls, 1979; 1984). This social comparison emerges as a salient aspect of performance goals. As such, this research has shown that children who define ability relative to others are essentially egoists who attempt to demonstrate their competence to other people (Nicholls, Cheung, Lauer, & Patashnick, 1989). Particularly within classroom settings, children are motivated to demonstrate their capacity relative to their peers. Students who endorse this egoist view adopt performance goals as they are motivated to "Show others that they are smart" and "Feel that they are most successful when they perform better than other

students”. These egoistic, self-referential components have become a central part of performance goal orientations.

Both the literature on theories of intelligence and the nature in which children define ability have implications for the development of achievement goals. Incremental theories of intelligence account for the mastery views that younger children adopt. Additionally, as children begin to expand their definition of ability, they not only view ability as a potentially fixed trait, but also as a testament of their capacity when compared to other students, which leads to the adoption of performance goals.

Context Matters

As students move through environments, their contexts can shape goal orientations. Prior work has demonstrated that individual attributions and perceptions of ability may influence goal orientations. It is also possible that situational and environmental demands can make certain goal structures salient and elicit differential patterns of cognition, performance, and emotion (Ames & Archer, 1987; Ames & Ames, 1984; Ames, 1992). In response to much of the achievement goal research conducted within the laboratory, several researchers began examining the salience of the multiple environments, considering the contextual and developmental mechanisms that support goals. In addition, research has considered the implications of dissonance amongst multiple learning environments.

In order to examine the environment in relation to achievement goals, researchers initially began to look at goal structures within the classroom (Ames & Ames, 1984, Ames, 1992). According to this perspective, classroom settings can have competitive, cooperative, and individual goal structures (Ames & Ames, 1984). Competitive

structures are those that emphasize social comparison and an individual student's relative standing compared to other students. As such, this structure elicits performance goal orientations. Similarly, a cooperative classroom structure, which emphasizes teamwork and collective effort, can also lead to performance goal orientations because students measure their group success relative to other groups. However, in individualistic classroom structures, students measure their success in terms of their own performance, focusing on change over time. This structure can elicit a mastery goal orientation. Although the examination of goal structures across cooperative, competitive, and individual dimensions was a preliminary categorization of goal structures, this work provided support for examining the developmental change in goal contexts, which had not been previously considered.

The appearance of individual, competitive, and cooperative structures coincides with the emergence of mastery and performance goal oriented contexts. Preschool and early elementary school environments are predominantly mastery oriented (Grolnick & Ryan, 1992; Dweck, 2002), which corresponds to the individualistic classroom structure that is also prevalent. Although social comparison is possible at this age, research demonstrates that children in early elementary school are not as attuned to social comparison cues as are children in middle school and beyond (Ruble, Eisenberg, & Higgins, 1994).

In contrast with elementary school, where learning and mastery are generally emphasized, performance oriented contexts are pervasive starting in middle school and continuing through high school and college. In middle school, the classroom environment becomes increasingly competitive and based on evaluative standards such as

grades, test scores, ability grouping, and class ranking. Specifically, students can be exposed to honor rolls and assigned to classes on the basis of their ability. Indeed, research has demonstrated that middle school teachers reported an increased emphasis on getting top grades and less of an emphasis on individual improvement than elementary school teachers (Midgley, Anderman, & Hicks, 1995). Similarly, in the same study, middle school students reported increased emphasis on performing better than others as compared to their elementary school counterparts.

Social comparison becomes a salient factor as students are constantly compared to the performance of their peers. In addition, as middle school also presents an increased influence on relative ability, this academic environment may also activate negative emotional experiences, particularly for 6th grade students as they are earlier in the transition to middle school (Middleton, Kaplan, & Midgley, 2004). Alternatively, middle school students in 7th grade and above may have adjusted to the performance oriented context and may be less like to have the same negative emotional reactions to the environment.

The transition into middle school also represents a critical developmental period in which children enter early adolescence. At this time, children adopt different role-related attributes (Harter, Bresnick, Bouchey, & Whitesell, 1997). Children begin to view themselves as possessing an academic (cognitive) competence, social competence, physical competence, and a general sense of self-worth. This is a time period that often presents conflict as adolescents try to resolve their multiple roles. Middle school environments compound this conflict because students have multiple classes and subject areas through which they can define themselves. The impersonal nature of the middle

school environment supports stable, trait-like identity development in academics as students are defined and recognized by teachers and parents by their academic performance. As Nicholls (1990) finds, early adolescents begin to subscribe to more rigid views of ability. As a result of the vast array of developmental and contextual changes, early adolescents are at risk for experiencing a decline in motivation and engagement in academic tasks (Eccles, Lord, & Midgley, 1991; Eccles, Wigfield, Midgley, Reuman, Mac Iver, & Feldlaufer, 1993; Midgley, et. al, 1995). Even more troublesome, children who have previously experienced problems within school are at risk for future academic difficulty (Maehr & Midgley, 1993). For these reasons, achievement goal researchers must consider the combination of developmental and contextual factors that cause students to endorse achievement goal orientations.

Each of these aforementioned researchers uniquely contributed to contemporary perspectives of achievement goal theory. Dweck added the self-theory component, Nicholls added important dynamics of performance (ego-driven goals), and Ames contributed the importance of examining the environmental and developmental factors that influence goal orientations. These combined perspectives, later termed “normative goal theory”, have served as the foundation of achievement goal theory. Although normative goal theory was able to explain why students approach mastery and performance goals, less is known about the reasons that students avoid achievement contexts based on these goal orientations. The avoidance dimension was initially acknowledged in early achievement motivation theory as the “fear of failure” (Atkinson, 1964); yet it was ignored in later goal theory research. However, as achievement goal researchers studied achievement-related experiences such as test-taking and working on

challenging tasks, they discovered that some students chose to avoid demonstrating their competence. In order to examine the implications of the avoidance dimension, researchers revised normative goal theory (mastery/performance) to emphasize the approach and avoidance dimensions of goal pursuit (Elliot, 1999; Elliot & Church, 1997; Middleton & Midgley, 1997).

Approach and Avoidance Distinction

The approach and avoidance components of achievement goals were previously considered by early achievement goal theory research (Atkinson, 1962; Dweck & Wortman, 1982; Nicholls, 1984), although never explicitly tested as distinct goals. Previously, Atkinson added the motive to avoid failure as a parallel to the motive to achieve success. However, empirical evidence of distinctions between approach and avoidance dimensions for achievement goal theory was not considered until the late 1990's. Building on Atkinson's conceptual underpinnings for the motive to avoid failure, achievement goal theorists began to examine the impact of approach and avoidance dimensions in both the experimental and classroom based research (Elliot, 1997; 1999; Middleton & Midgley, 1997).

The approach and avoidance dimensions of motivation are deeply rooted in early theories of achievement behavior (see Elliot, 1999 for a review of these theories). When an individual adopts an approach orientation, they are motivated by the possibility of a desirable future event. However, when an avoidance orientation is adopted, an individual is motivated to prevent an undesirable future event (Elliot, 1999). As such, researchers began to consider a trichotomous framework to account for the approach and avoidance

dimensions of performance goals³. According to this theoretical model, performance goals are divided into performance-approach goals, in which individuals are focused on attaining and demonstrating competence, and performance-avoidance goals, in which individuals are focused on preventing the demonstration of their incompetence (Elliot, 1999). Under this framework, performance goals can take three distinct forms: 1.) a personal desire to validate one's ability or to do well, 2.) a competitive notion of outperforming others, and 3.) an attempt to avoid failure. As many researchers began to empirically test these distinctions, they found that when the goal was to avoid failure, performance goal orientations were associated with maladaptive outcomes (Elliot, 1997).

This has resulted in the current conceptualization of achievement goals, which emphasizes mastery-approach, performance-approach, and performance-avoidance goal orientations. Research has suggested that performance-approach goals, which emphasize the demonstration of high ability, have more adaptive outcomes than performance-avoidance goals (Pintrich, 2000). Indeed, much research has confirmed these findings, demonstrating that performance-approach goals have been positively linked to meta-cognitive strategy use, positive self-concept, and grades (Skaalvik, 1997, Wolters, Yu, & Pintrich, 1996). The performance-avoidance dimension is linked to a fear of failure and negatively associated with grades, strategy use, and self-concept (Elliot 1997; 1999; Middleton & Midgley, 1997). This has led to much theoretical debate within the

³ Recently, goal theorists have expanded this framework to include mastery-avoidance goal orientations (Elliot, 1999; Pintrich, 2000). Due to the paucity of literature that has examined mastery avoidance goals, they will not be discussed in the context of this manuscript. Additionally, as mastery goals have not contributed to the mixed findings surrounding achievement goals, we turn to a detailed discussion of performance-approach and avoidance goals.

achievement goal research, which has spurred new conceptualizations about the goals that students can pursue in the classroom.

Relation between Achievement Goal Orientations and Outcomes

Mastery and performance goal orientations have been differentially linked to students' cognitive engagement, specifically to achievement/performance and self-regulated learning (e.g., Pintrich, 2000). Many studies have demonstrated that a mastery goal orientation is linked with more adaptive patterns of learning. In particular, students who focus on trying to develop their competence are more likely to persist in the face of challenge (Elliott & Dweck, 1988) and use higher level cognitive strategies such as elaboration on ideas, critical thinking, and self-regulated learning (e.g., Elliot, McGregor, & Gable, 1999; Meece, Blumenfeld, & Hoyle, 1988; Middleton & Midgley, 1997; Nolen & Haladyna, 1990; Pintrich, 2000; Pintrich & Garcia, 1991; Wolters, Yu, & Pintrich, 1996). It is through these adaptive patterns of engagement that individuals endorsing mastery goal orientations are thought to perform better in academic settings. Indeed, a number of studies have found a positive link between mastery goal orientations and achievement (measured in terms of grades and test scores) (e.g., Church, Elliot, & Gable, 2001; Kaplan & Maehr, 1999a; Linnenbrink, 2005). However, some caution is needed in that some studies have also found no significant relation between mastery goal orientations and achievement (e.g., Barron & Harackiewicz, 2001; Elliot & McGregor, 2001; Elliot et al., 1999; Harackiewicz, Barron, Elliot, Carter, & Lehto, 1997;

Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Pintrich, 2000). Importantly, there are few studies that suggest a negative association between mastery goals achievement.⁴

A more consistent pattern is seen for performance-avoidance goal orientations. Specifically, performance-avoidance orientations are associated with withdrawal and disengagement from academic tasks as well as with performance decrements (Elliot, 1997, Middleton, Kaplan, & Midgley, 2004). They have also been linked to shallow evaluation, poor retention of information, and poor performance outcomes (Elliot & McGregor, 1999).

In contrast, the findings linking performance-approach goals to academic outcomes are inconsistent. With respect to cognitive strategies and engagement, some studies show a positive association between performance-approach goals and cognitive regulation (e.g., Meece, Blumenfeld, & Hoyle, 1988; e.g., Wolters, Yu, & Pintrich, 1996); however, several studies have found no significant relation (e.g., Kaplan & Midgley, 1997; Middleton & Midgley, 1997) and still others report a negative relation (e.g., Newman, 1998). For persistence, the findings are also mixed. For instance, in a study on middle school students' motivation in math and English, Kaplan and Midgley (1997) found that performance-approach oriented students were more likely to quit or opt out of an assignment that they did not want to complete. Similarly, Grant and Dweck (2003) found that performance-approach students (who endorsed ability based goals) were more likely to use time and energy withdrawal after the experience of failure. In contrast, Pintrich and Garcia (1991) reported no relation between performance-approach

⁴ As evidenced by a recent review (Linnenbrink-Garcia, Tyson, & Patall, 2008), 4% of studies found a negative relation between mastery goals and achievement. However, caution is advised when interpreting this finding as this review did not incorporate a test of the magnitude of these effects.

goals and effort management while Elliot and his colleagues (1999) reported a positive relation of performance-approach goals to effort and persistence. As such, it is not clear whether performance-approach goals lead to the type of high quality cognitive processing and engagement that should lead to higher levels of achievement. When achievement is directly examined, the findings are also mixed with some studies reporting a positive relation (Bouffard, Vezeau, & Bordeleau, 1998; Pintrich, 2000; Wolters, Yu, & Pintrich, 1996), some finding no relation (Kaplan & Maehr, 1999a; Roeser, Midgley, & Urdan, 1996), and still others finding a negative relation (Newman, 1998).

In examination of the links between achievement goals and achievement outcomes specifically, a recent review sought to determine the frequency of the association among each goal orientation and achievement outcomes (Linnenbrink-Garcia, Tyson, & Patall, 2008). The results of the review suggest that in over 90 empirical studies examining the association between self-reported goals and achievement outcomes, approximately 40% of the effects show a positive relation between mastery goal orientations and achievement and 4% show a negative relation. Alternatively, in the same studies, approximately 40% of the studies show a positive correlation between performance goals and achievement, while only 5% show a negative relation. These recent findings seem to suggest that either goal orientation can be adaptive in classroom settings, yet the broader achievement goal literature does not arrive at the same consensus because of ethical and ideological concerns about the proper environment that should be promoted in classrooms. From an ethical perspective, much research has placed an emphasis on finding the positive associations between mastery goals and achievement outcomes because of the notion that students *should* focus on working hard and

improving in class, rather than competing with other students. In contrast with this perspective, current classroom environments are focused on the notion of student performance, meeting expectations for state and national level achievement, and so on. Thus, aspects of performance goal orientations naturally arise and are pervasive in classrooms. Thus, it is imperative to determine how students can function in these settings.

In an attempt to elucidate the findings for each of the three major achievement goal orientations and outcomes such as learning, cognitive engagement, and performance, research has turned to an exploration of the multiple factors that socialize children toward different goal orientations. Indeed, Ames (1984) indicated that a consideration of specific environmental influences can clarify the impact of achievement goals. The trichotomous framework for achievement goal theory has provided a solid foundation for examining the socialization that takes place across contexts, the most influential being home and school environments. At home, parents can influence the adoption of achievement goals both directly and indirectly via messages about prior achievement. Similarly, schools can directly and indirectly cause students to endorse achievement goal orientations. Accordingly, some research has sought to identify those for whom these messages about achievement goals can be particularly detrimental. This section will examine the socialization of achievement goals, considering the literature on the role of home, school, and ethnicity.

SOCIALIZATION OF ACHIEVEMENT GOALS

Parenting and Achievement Goal Orientation

Early achievement motivation theorists conducted experiments involving students in introductory psychology classes (McClelland et. al, 1953; Atkinson, 1967). Although informative for determining individual levels and types of achievement motivation as it relates to behavior, these studies were unable to examine some of the external forces that impact and shape the development of motivation such as parents and other family members. Several early studies acknowledged the role of parents (Atkinson, 1964) but few empirically tested the relationships. Although limited, early achievement motivation research found that parents play a role in the development of the need for achievement (McClelland et. al, 1953) as level of parent involvement in student's schooling predicted the student's motive to achieve. Indeed, research on goal attainment suggests that significant others, particularly family members, influence both the goals individuals pursue and the mental representations of those goals (Shah, 2003). Currently, the research on achievement goal theory has begun to identify the distinct ways in which parents foster the development of goal orientations.

There are several aspects of parenting that may affect achievement goal pursuit. Some of these include parenting styles (i.e., authoritarian & authoritative), direct communication about learning, and the socialization of parents' expectations for their children's academic success (i.e., praise & communication). Much of the literature on parenting styles finds evidence that authoritative styles are linked to the types of cognitive engagement that are often associated with a mastery goal orientation such as enhanced effort and persistence (Baumrind, 1971). An important caveat to parenting

styles research is that this work has only been shown to apply to European Americans, rather than across different ethnic groups. The parenting literature has shown that broader aspects of parenting such as warmth, emotional support, and communication offer more complete accounts of how parenting influences child development across ethnic groups (McLoyd & Smith, 2002). Thus, a more comprehensive picture of how parents influence achievement goal pursuit can be obtained by examining the ways that parents communicate with and offer support to their children.

Praise for intelligence. One manner of communication that has received attention as a precursor to goal development is the feedback and praise that parents give their children. Parent feedback and praise for achievement can begin as early as infancy. Attempts to master new skills develop in three phases starting from birth (Stipeck, Recchia, & McClintic, 1992; Barrett & Morgan, 1995). The first phase, before age two, involves a child's attempts to complete tasks in his or her environment. During this phase, children engage new toys and enjoy finding new toys in the environment that they can master. The second phase, as children near age two, involves evaluating oneself by the approval of others. They seek approval when they succeed and await disapproval when they fail. The third phase, beginning after age three, involves the emotional responses to completing or failing to complete certain tasks. Here, children are capable of experiencing both pride (as opposed to joy) and shame (as opposed to disappointment). A critical intervening force is parental feedback. When a parent responds to a child with positive affect even when the child fails at a task, this demonstrates to the child that the parent values his/her effort. In this manner, feedback encourages children to pursue new goals and focus on learning rather than on the outcome.

Parent feedback in response to achievement continues to have an impact on children's perceptions of success and effort as they enter elementary school and begin to receive grades, test scores, and teacher comments as indicators of academic progress. At this time, the feedback and praise that parents administer can impact children's interpretation of their achievement and the meaning of their grades test scores and teacher comments. For example, praising a child's intelligence or ability can later have detrimental effects on overall motivation and performance because of a focus on the outcome (e.g. test performance) rather than the child's effort (Diener & Dweck, 1978; Ames & Archer, 1987; Butler, 1987; Mueller & Dweck, 1998). When praising academic achievement, parents either emphasize their children's ability and intelligence or their hard work and effort. Praising ability and intelligence has been shown to foster an entity theory of intelligence, which is the belief that intelligence is a fixed trait and the grade of "A" or "excellent" demonstrates that they possess that trait. This type of feedback from parents can lead children to adopt performance orientations toward achievement because they are focused on demonstrating their high ability. Parents may foster the development of learned helplessness when they evaluate the academic outcomes of their children with praises of ability rather than effort (Diener & Dweck, 1978). These messages are problematic because they imply that failure is due to a lack of ability rather than effort.

On the other hand, praising hard work and effort fosters an incremental theory of intelligence, which entails viewing intelligence as malleable. An example of praising hard work can be demonstrated in the same example of bringing home a test grade. If a child brings home an "A" on a science test and a parent says "You must have worked hard to earn that score", the parent activates the view that hard work produces high

grades. This form of feedback can lead children to adopt mastery orientations toward achievement because they view their effort as a means to academic success.

The impact of parental communication in the form of praise has been traced across the lifespan. In a study of 501 mothers of children from kindergarten through fifth grade, Ames and Archer (1987) confirmed that mothers who endorsed mastery goals as opposed to performance goals possessed differences in the ways that they viewed the learning process and made attributions for their child's success. For example, mothers who endorsed mastery goals were more likely to define school success as improvement and working hard, preferred that their children work on tasks that offered a challenge, and attributed their child's success to effort. On the other hand, mothers who endorsed performance goals were more likely to define school success in terms of grades, preferred that their children work on tasks that ensured success, and attributed success to ability.

It is important to note that while all mothers in this study indicated that they wanted their children to earn good grades and do well in school, there were individual differences in the value that parents placed on effort and ability, depending upon the goal orientation that they endorsed. Thus, the critical element of parent feedback and communication about goals resides in the ways in which parents view the learning process and how they effectively communicate *how* their children can reach their goals for academic success.

Praise has also been found to impact the performance of students in elementary school. In a series of experimental studies with 5th grade students, after performing a difficult task, children who received feedback praising their ability were more likely to choose performance oriented tasks. On the contrary, students who received feedback

praising their effort chose to complete mastery oriented tasks. Similarly, another experimental study involving kindergarten children showed that different types of feedback had a critical impact on the child's cognition, affect, and behavior (Kamins & Dweck, 1999). For example, feedback such as "I'm very disappointed in you" had undermined subsequent performance more than "Maybe you could think of another way to do it". It is important to note that these experimental studies used a neutral experimenter to administer feedback about student progress and are, therefore, only indicative of a parent's role. Due to their ongoing relationships with the child, parental messages are likely more powerful among young children.

These studies indicate that, indeed, parent involvement in the form of communicating praise in academic contexts can have a critical impact on children's goal orientations. More specifically, parent communication about the reasons for learning and feedback about academic progress is a predominating factor that can influence student approaches to academic tasks. However, the critical point is that communicating fixed views about intelligence alone can have detrimental effects on child performance, subsequent motivation to complete new tasks, and emotional response to difficulty. It is the message behind ability feedback that can be harmful. During the early stages of development when children are forming their beliefs about competence, communicating entity theories of intelligence can lead to the adoption of performance goals, fixed views of ability, and disengagement when students believe that their poor performance denotes lack of ability. Children may experience hesitancy to attempt new tasks and approach challenge. However, as previously demonstrated, performance oriented environments become salient as children enter more competitive school environments, starting in

middle school. As performance-approach environments begin to appear, the way that parents communicate beliefs about learning has the potential to impact student achievement.

Whereas much of the work that has explored the role that parents have in shaping academic motivation has focused on elementary school, there is evidence that parent communication about learning and expectations for academic achievement may very well have a lasting impact through adolescence (Elliot & Thrash, 2004; Hill, Castellino, Lansford, Nowlin, Dodge, Bates, & Petit, 2004). As a recent meta-analytic review indicates (Hill & Tyson, in review), parent involvement via academic socialization, which includes communicating expectations for future achievement, has a stronger impact on achievement outcomes as well as various indicators of self-regulation, self-esteem, and a child's future career aspirations than other types of involvement. With regard to specific aspects of parenting that shape achievement goals, Elliot & Thrash (2004) have found that parental fear of failure was positively related to fear of failure in undergraduate students. In addition, when parents held a fear of failure, this was negatively associated with mastery goals, yet positively associated with both performance-approach and avoidance goals. As such parental praise, communication, and beliefs, among the many other factors that influence goal adoption, should continue to have an impact on student goal adoption.

Classroom & School Goal Context

As students engage in academic contexts, their school environments can also shape goal orientations. While acknowledging that individual attributions elicit goal orientations, research has examined the possibility that specific classroom elements and

broader school level components can also socialize goal orientations (Ames, 1984; 1992; Maehr, 1991; 1993). In order to encapsulate the elements of classroom structure that impact goal orientations, Ames and colleagues devised the TARGET framework, a concept derived from the earlier work of Epstein (1989). TARGET emphasizes six classroom elements: task, authority, recognition, grouping, evaluation, and time (Ames, 1990; 1992). More specifically, the *Task* dimension involves the attributes of the tasks that teachers design, which can enhance student interest. *Authority* refers to the degree to which teachers allow students to have choices and responsibility within classrooms. *Recognition* and *reward* concern the way in which teachers recognize a student's progress, improvement, and academic growth. *Grouping* involves the way in which teachers organize students. Ability grouping or arranging students in groups based on their current ability can emphasize social comparison. *Evaluation* involves the way in which teachers administer feedback. Finally, *Time* emphasizes the way in which teachers disperse classroom time to maximize the learning experience. Each of the TARGET elements can influence classroom learning and either mastery or performance orientations. These elements are useful in identifying how goal orientations are fostered in the classroom. However, rather than focusing on the appearance of each of these elements, this dissertation considers how goal orientations are shaped more broadly, particularly during the transition to middle school during which there is a shift in classroom and school goals.

The evaluative component of classroom structures is one element that increases in prevalence during the transition to middle school. The evaluation structure within classrooms concerns the way in which students both receive and interpret evaluative

information in the classroom. Evaluation can create a performance environment when social comparison is highlighted. An emphasis on public classroom evaluation such as announcing highest and lowest grades and grouping students by ability can not only lead to the adoption of performance orientations, but can also cause students to make attributions about their ability when they encounter both success and failure. The habit of attributing success to ability and relative standing compared to peers can have a particularly detrimental impact when students do not perform well. In the case of failure, if a student attributes poor performance to their ability, the result can be negative perceptions of their future capability and avoidance of challenge in future academic contexts (Ames, 1992).

Broader school environments can also facilitate students' endorsement of a performance-approach goal orientation. In particular, as students transition to middle school, where the environment shifts from a mastery oriented to a predominantly performance oriented environment (Blackwell et. al, 2007; Maehr & Midgley, 1993; Midgley et. al, 1995), social comparison is highlighted by the increase in public display of grades and test scores in school hallways. In an attempt to facilitate the transition, researchers have proposed ways in which schools can integrate mastery oriented goals into the school culture using the TARGET framework (Maehr, 1993).

These findings leave two remaining concerns regarding the socialization of achievement goal orientations: 1.) the generalizability of the impact of messages that involve praise for intelligence or effort for students from diverse demographic backgrounds and 2.) the agreement among socializers on goal orientations, and the generalizability across age and social-emotional functioning (Linnenbrink & Fredericks,

in press). In addressing the first concern, the following section will address how praise for intelligence can have implications for the achievement goals of ethnic minorities (Kaplan & Maehr, 1999a; 1999b). Whereas achievement goal theory generalizes across ethnic groups, there is some evidence that endorsement of performance goals is more strongly associated with negative emotional experiences and strategies for African American students (Kaplan & Maehr, 1999a). Moreover, prior research finds that different types of parenting practices are associated with achievement across ethnicity (Baumrind, 1971; Chao, 1994; Steinberg, Mounts, Lamborn, & Dornbusch, 1989). With regard to the second concern, studies have begun to consider that performance-approach goals may be adaptive in high school and college due to the increasing emphasis on competition (Harackiewicz et. al, 2001). However, as this paper will discuss in later sections, it may be the case that performance-approach students who perform successfully after the transition to middle school may have developed and employed the social and emotional skills that are necessary for achievement, such as cognitive reappraisal strategies.

Ethnicity

As the previous section has demonstrated, environmental factors can shape the achievement goals that students endorse. Achievement environments can also interact with individual factors to influence achievement goal orientation. One such factor that has emerged in the achievement goal theory literature is ethnicity as environments that make identity and achievement salient have been shown to impact the achievement of ethnic minority populations, particularly African Americans (Graham, 1994; Kaplan & Maehr, 1999b). As research on ethnic minorities in achievement contexts demonstrates,

being reminded of one's group membership when the group possesses a negative stereotype for academic performance can negatively impact achievement (Altschul, Oyserman, & Bybee, 2006; Cole, Matheson, & Anisman, 2007; Steele, 1997). Due to these prominent research findings, some research in achievement goal theory has considered how messages in classrooms that can highlight ethnicity and achievement may influence the performance of African American students.

Rather than exploring mean level differences in adherence to goal orientations as a function of ethnicity, research has specifically explored how academic contexts that make racial identity salient can impact the achievement goals of ethnic minority students (Steele, 1997; Good & Aronson, 2002). Although much of the achievement goal literature has been validated on diverse populations (Dweck, 1982; Mueller & Dweck, 1998; Middleton, Kaplan, & Midgley, 2004), some researchers have considered the unique role of praise and school contexts for African American students.

Intelligence, Praise, and the Role of Performance Goal Environments for African American Students

As achievement goal theory is concerned with the *perception* and *pursuit* of goals (Kaplan & Maehr, 1999b), praise for intelligence has a strong impact on achievement goal orientations. From this literature, two critical points emerge with regard to parent praise for intelligence in the face of failure: (1) these appraisals can predict a student's motivation for learning and the goals that he/she pursues and (2) these appraisals can also impact a student's view of his/her intellectual competencies. The latter is a salient issue for ethnic minority students, particularly African Americans. Claude Steele's (1997) research on stereotype threat demonstrates how stereotypes that threaten a student's

perception of his or her ability can actually diminish academic outcomes. In the same manner, parent or teacher praise for ability can be harmful, especially for African American students as they are often subject to situations that question their ability via stereotype threat. Situations that activate stereotype threat are likely to activate negative emotional experiences (Steele, 1997). Indeed, research has considered that African American students who pursue performance goals may also experience more anxiety and negative emotional experiences. Kaplan and Maehr (1999a) found that African American students who pursued performance goals were more likely to experience negative affect and have difficulty controlling their emotions in academic contexts compared to European American students.

Environmental Influence

Current research has examined the impact of contexts that elicit stereotype threat on achievement goal pursuit. In a survey study of over 2,000 African American and Latino middle school students from various schools across Los Angeles, Harven and Graham (2006) tested the relationship between perceived racial discrimination and achievement goal orientations. Preliminary findings indicate that as perceived discrimination from teachers and school personnel increased, student adherence to mastery approach goals decreased (Harven & Graham, 2006). Additionally, as peer discrimination increased, minority students' adherence to performance avoidance goals increased (Harven & Graham, 2006). These preliminary results highlight the salience of contextual factors when examining achievement goal orientation. In a similar fashion, research exploring the broader school influence indicates that African American students,

in particular, benefit from mastery-oriented environments, more so than White students (Kaplan & Maehr, 1999a).

Socialization Summary

Despite findings that indicate performance-approach goals can be associated with positive academic outcomes such as cognitive strategy use, task value, and self-efficacy (Wolters, Pintrich, & Yu, 1996), many goal theorists have argued for the promotion of mastery goals, particularly as children reach early adolescence and enter environments that emphasize ability and performance. As such, during the late 1980's, many researchers who applied goal theory conceptualized mastery and performance goals along a continuum, where mastery goals were viewed as positive and performance goals (both approach and avoidance) were negative. Many of these studies were conducted in the laboratory, incorporating between subjects designs, which did not allow for an assessment of the pursuit of multiple goals (Pintrich, 2000). Thus, in the 1990's, researchers began contest this general view in support of research that indicated some positive benefits for performance-approach goals. As such, researchers examined whether both goals orientations may be adaptive, and that students could conceivably pursue both goals at once (Barron & Harackiewicz, 2001; Pintrich, 2000).

Multiple Goals Perspective

Termed the multiple goals perspective, researchers examined the independent and interactive effects of goals, and identified multiple pathways for learning (Pintrich & Garcia, 1991). The multiple goals perspective predicts that having high levels of both goals may be most adaptive (Pintrich, 2000), whereas normative goal theory would view high levels of mastery and low levels of performance goals as most adaptive. This view

predicts that focusing on learning while simultaneously trying to do better than others (high mastery and high performance) represents an interactive pattern of achievement goal orientations. The multiple goal perspective represents a developmentally sound perspective about the nature of achievement goals. As earlier work predicts a shift from mastery to performance oriented environments during the transition from elementary school to middle school, the multiple goals perspective purports that students can incorporate performance oriented goals into their broader goal orientation in adaptive ways (Pintrich, 2000).

According to the multiple goals perspective, there are four goal patterns: high mastery/high performance, high mastery/low performance, high performance/low mastery, and low mastery/low performance. In order to test these distinctions, Pintrich (2000) created median splits to examine adherence to each goal combination among 150 middle school students across the transition to high school. In agreement with the multiple goals perspective, students who endorsed high levels of both mastery and performance goals were indistinguishable from students who endorsed high mastery/low performance goals on measures of self-efficacy, cognitive strategy use, and affective responses (Pintrich, 2000). The results indicated that when coupled with mastery goals, performance-approach goals did not detract from performance. Overall, the literature on multiple goals has proven inconclusive as experimental and survey studies fail to demonstrate an interaction between mastery and performance-approach goals (see Linnenbrink-Garcia, et. al, 2008 for a review). Though the interactive view of multiple goals is only one of the ways in which goals can combine under the multiple goals perspective, the other combinations have not been thoroughly tested.

Goal Theory Debate

The merits of pursuing approach and avoidance dimensions of both mastery and performance goals have been extensively reviewed in the achievement goal literature. This has resulted in a debate among achievement goal theorists that concerns the implications for promoting performance-approach goal orientations. Generally, mastery oriented goals have been endorsed in classroom and home environments as the superior goal environments to promote learning and effort during challenging tasks (Ames, 1984; 1992; Midgley & Maehr, 1993). However, some researchers have acknowledged that in academic contexts, students are encouraged to become interested in their work and perform at optimal levels simultaneously (Barron & Harackiewicz, 2001). These researchers have taken the perspective that performance-approach goal orientations may be adaptive when coupled with mastery-approach goals.

On one side of the debate, Midgley and colleagues found that performance-approach have the potential to produce maladaptive outcomes (Middleton, Kaplan, & Midgley, 2004). According to Middleton, Kaplan, and Midgley (2004), an extensive consideration of the developmental trajectory of achievement goals does not support the promotion of performance-approach goals. In support of this argument, they present evidence that some students who endorse performance-approach goals are susceptible to later endorsing performance-avoidance goals. For example, in a longitudinal study of middle school students, those who were high in perceived competence and endorsed performance-approach goals in 6th grade adopted performance-avoidance goals in 7th grade (Midgley, Kaplan, & Middleton, 2001). This change in endorsement of goals may be the result of middle school students becoming more acclimated with the structures of a

performance goal environment over time. Additionally, in a study of college students in an introductory college course, performance-approach goals were initially linked to grades on an exam while mastery goals were unrelated. However, at the end of the course, mastery goals were related to grades on a pop quiz while performance goals were unrelated (Elliot & McGregor, 1999). This study provides some evidence that mastery goals support consistent gains in learning over time. From these studies, the benefits of performance-approach goals are not apparent when they are considered under a longitudinal framework. In fact, very few studies like these have examined the longitudinal effects of goal orientations and how they are related to each other (Middleton et al., 2004). Finally, these researchers acknowledge the fact that the multiple goals perspective can be helpful, yet further work needs to test the developmental impact of possessing multiple goals.

Another point introduced by this side of the debate is that it may be detrimental for teachers to create a performance goal structure in classroom contexts. For example, in a study in which students reported teacher emphasis on the demonstration of ability, students were more likely to report avoiding challenge (Ryan, Gheen, & Midgley, 1998). When performance is activated in the environment, children are susceptible to adopting either performance-approach or avoidance orientations.

Finally, in their review, Midgley et al. (2001) argued that performance-approach goals are associated with processes that do not necessarily enhance the learning process. Several studies find a link between performance-approach goals and superficial strategy use (Graham & Golan, 1991; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000).

Additionally, across the studies in college populations, there is no link between performance-approach goals and intrinsic motivation.

In summary, Midgley et al. (2001) concluded that a reconceptualization of achievement goal theory proves unnecessary as they *disapprove* of the message that endorsing performance goals is adaptive. While Midgley and colleagues acknowledge that performance-approach goals can be beneficial when mastery goals are also endorsed by the student, they disagree with an creation of a performance goal structure in the school context, which already heavily focuses on performance (Ames, 1992; Maehr & Midgley, 1993). Thus, this review indicates that enforcement of performance goal structures in schools may be detrimental.

On the other side of this debate, Harackiewicz, Barron, Pintrich, Elliot, and Thrash (2002) also reviewed the achievement goal literature and argued that the eventual reconceptualization of achievement goal theory is warranted as multiple studies have documented the positive link between performance-approach goals and achievement outcomes. This perspective rests on three central points: (1) the inconsistent definitions of performance goals have implications for measurement and interpretations, (2) performance-approach goals are potentially adaptive, and (3) goals can combine in multiple ways to produce achievement outcomes.

In addressing the first point, Harackiewicz et al. (2002) found that the literature on performance-approach goals is less consistent than for mastery goals. Goal researchers on both sides of the debate acknowledge this shortcoming of achievement goal research (Midgley, Kaplan, Middleton, Maehr, Urdan, Anderman, Anderman, & Roeser, 1998), indicating the differing definitions of performance goals (which range

from a desire for self-presentation to competition). Additionally, whereas approach and avoidance dimensions were often described in earlier literature, normative goal theory has failed to tease apart these dimensions and measure the distinct impact of performance-approach and avoidance goals.

Second, Harackiewicz et al.'s (2002) review demonstrated that although the literature on performance-approach goals and adaptive outcomes is inconsistent for some outcomes such as effort expenditure, grades, and actual performance, these goals consistently lead to enhanced outcomes (e.g., Bouffard, Vezeau, & Bordeleau, 1998; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Pintrich, 2000). Backed by extensive empirical evidence that demonstrates positive benefits of performance-approach goals, this side of the debate concluded that achievement goal theory should be revised such that mastery and performance-approach goals are both viewed as beneficial.

Finally, the third point raised is that achievement goals can potentially combine in many ways to produce achievement outcomes. Noticing this trend among many studies that have examined achievement goal theories, Harackiewicz et al. (2002) described a theoretical model of a multiple goals perspective. The first of these is an additive goal pattern whereby mastery and performance goals can both have independent, positive effects on a student's goals. The second is an interactive goal pattern whereby mastery and performance goals have a dependent nature. In this pattern, having high levels of performance goals may be beneficial when high levels of mastery goals are present. Third is a specialized goal pattern whereby goals can differentially influence outcomes. Empirical support for this perspective was found in a study in which goals were manipulated; mastery goals were indicative of interest levels and performance goals were

associated with scores on final examinations (Barron & Harackiewicz, 2001). Finally, the selective goal pattern supposes a level of increased developmental awareness about one's goals. This pattern refers to focusing on the goal orientation that is important at the time and to the notion of goal shifting.

The long history of this area and its debates has led goal researchers to many conclusions. First, multiple goals can be pursued simultaneously, as evidenced by the work of Pintrich and colleagues. This dismisses arguments that goals are located on a bipolar continuum, where mastery goals and performance goals are mutually exclusive. Second, context matters in the pursuit of achievement goals. Both experimental and survey data show that during the middle school context, where performance structures are more pervasive, students are attuned to messages from teachers, parents, and peers that influence their adoption of achievement goals (Elliot & Thrash, 2004; Midgley et. al, 1995; Mueller, & Dweck, 1998).

Finally, according to the current framework, it is unclear which goals produce superior achievement outcomes. Current perspectives in the area have acknowledged the need for moving from an examination of which goals are better for achievement to an investigation of the conditions under which one goal orientation or another results in superior outcomes. As evidenced by the work of Pintrich (2000; 2003), Maehr (2001), and many of their colleagues, achievement goal theory currently needs to explore the other psychological processes that lead to achievement goals and sustain the pursuit of goals within the classroom context.

Attempts to Resolve Inconsistent Findings for Performance-Approach Goal Orientations

To date, the findings on achievement-related behaviors resulting from the adoption of particular goals remain inconsistent. As is clear from the prior discussion, the separation of performance-approach and performance-avoidance goal orientations is not a satisfactory solution as the mixed patterns for performance-approach goals are still prevalent even after making this distinction (Linnenbrink, 2005; Midgley et al., 2001). More recently, goal theorists have proposed other potential explanations for the discrepant pattern of findings, arguing for a multiple goal perspective in which performance-approach goals are adaptive when endorsed in conjunction with mastery goals (Barron & Harackiewicz, 2001). This multiple goals perspective, however, has also not satisfactorily resolved the ensuing debate and evidence of which types of goals are most adaptive in academic contexts (Midgley et al., 2001; Linnenbrink, 2005).

Another possibility for explaining the discrepant findings is that there is some unidentified moderator that alters the effects of performance-approach goals on various outcomes. For example, Dweck and her colleagues (Dweck & Leggett, 1988; Elliott & Dweck, 1988) proposed that performance orientations would have more serious detrimental effects when perceived ability was low. However, more recent research has failed to find support for the notion that efficacy or perceived ability moderates the relation of performance-approach goals to various outcomes (Midgley et al., 2001).

The inconsistent findings for the relation between performance-approach orientations and achievement outcomes suggest that there may be a gap in the theory that explains the nature of achievement goals. I propose that the missing link may be the failure to consider emotional experiences and the regulation of emotion. More

specifically, prior research shows that both mastery and performance-approach goals can yield academic benefits for students (Meece, Blumenfeld, & Hoyle, 1988; Pintrich, 2000; Wolters et al., 1996). However, to date, researchers have not identified underlying processes that explain why and when performance-approach goals enhance versus undermine various academic outcomes. This seems especially important given that performance-approach goals are inconsistently linked to the types of behavioral and cognitive engagement that should support learning; thus, self-regulation and persistence may be less useful as underlying mechanisms linking performance-approach goals to achievement. As such, the ability of performance-approach goal orientations to produce academic success may depend on other factors and underlying processes such as the emotional experiences of the student and the students' capabilities to regulate these emotions.

Achievement Goal Orientations and Emotional Responses

Research on the relation of achievement goal orientations and emotional responding may help us to better understand the discrepant findings for performance-approach goal orientations. In general, mastery goal orientations are consistently associated with experiencing a range of pleasant emotions including excitement and happiness (for recent reviews see Linnenbrink & Pintrich, 2000; Linnenbrink, 2007). Mastery goal orientations have also been linked to lower levels of unpleasant emotions including lower anxiety, sadness, and tiredness. In contrast, the findings for performance-approach goal orientations are mixed (Linnenbrink & Pintrich, 2002; Linnenbrink, 2007). With respect to pleasant emotions, the findings suggest that performance-approach goals are either positively related or unrelated. For unpleasant

emotions, there is stronger evidence that performance-approach goals are associated with higher levels of unpleasant emotions, particularly anxiety or frustration. Finally, performance-avoidance goal orientations have also been consistently linked to higher levels of negative emotions, especially anxiety, but unrelated to positive emotions (Linnenbrink & Pintrich, 2002).

From these overall patterns, it seems plausible that both performance-approach and performance-avoidance goal orientations may be associated with maladaptive patterns of emotional responding that may interfere with learning engagement. In particular, it is possible that students who endorse either performance-approach or performance-avoidance goal orientations may be more likely to experience “debilitating emotions” that may interfere with cognitive processing and engagement. *Debilitating emotions* refers to affective responses (either positive or negative) that interfere with cognitive processing. In academic settings, we expect anxiety, frustration, hopelessness, and overexcitement to be the most common debilitating emotions. Following the work of Revelle and Loftus (1990), debilitating emotions (most of which are quite high on activation) will interfere with cognitive processing, learning, and, ultimately, academic outcomes. This seems especially likely to occur in academic settings, where the tasks could be considered “high load”.

In academic settings, test anxiety is an excellent example of a debilitating emotion. Anxiety is comprised of both worry and emotionality (Covington, 1985). Worry involves a cognitive component in which students become preoccupied with the consequences of failure and self-criticism. The cognitive attention afforded to worry has been shown to undermine performance as it causes students to shift their focus away from

task demands (Elliot, 1999; Sarason, 1984). The emotionality portion of anxiety involves the physiological component, such as accelerated heart rate (Elliot & McGregor, 1999). As such, anxiety is a debilitating emotion both in terms of the cognitive element (reduced task focus) and in terms of the physiological component (accelerated heart rate). As a result of test anxiety, one can imagine that cascading arrays of other debilitating emotions are also possible, such as frustration, worry about the event, and potentially response-focused emotions such as hopelessness and shame.

By far, the most extensive research is on test anxiety; however, more recent research on emotions in education provides some support for the notion that unpleasant emotions such as frustration, anxiety, hopelessness, sadness, and boredom may also interfere with cognitive processing and learning (Linnenbrink & Pintrich, 2002b; Linnenbrink, Ryan, & Pintrich, 1999; Pekrun et al., 2002; Pekrun et al., 2006). We are unaware of research linking debilitating positive emotions, such as overexcitement, to academic functioning but it is likely that both overexcitement and intense pride may interfere with persistence, in particular. Given the potential interference from debilitating emotions in academic settings, understanding the regulation of these emotions is especially critical. Therefore, I turn to a brief overview of emotion regulation and, then, consider the potential interaction with performance-approach goal orientations and debilitating emotions.

EMOTION REGULATION

In the following sections, emotion regulation is examined in order to consider the potential interaction between emotion regulation and performance-approach goal orientations. First, self-regulatory theory will be presented as a multifaceted construct that encompasses the sub-theory of emotion regulation. Second, emotion regulation will be examined from multiple perspectives, highlighting its characterization as an emerging skill that develops in infancy and as a personality trait. Third, preliminary evidence of the impact of emotion regulation in academic settings will be discussed. Finally, suggestions for integrating emotion regulation into achievement goal theory will be presented.

Self-Regulation as a Multi-faceted Construct

The notion of controlling one's emotions, thoughts, motivation, and behavior are central tenets of most theories in psychology. Self-regulation represents one of these theories as it involves the process of monitoring, controlling, and evaluating progress toward a goal (Carver & Scheier, 1989). Predominating theories of self-regulation acknowledge the multidimensionality of this construct. For example, principle components that require regulation are cognition, motivation, behavior, and emotion. According to Kuhl (1996), self-regulation can be broken down into four main areas that people use to maintain their goals: (1) attention control (focusing on information), (2) motivation control (recognizing discrepancy between what one has accomplished and what has yet to accomplish), (3) emotion and activation control (changing uncooperative, detrimental emotions and focusing arousal), and (4) goal maintenance and impulse control (maintaining goal interest over extended periods of time). Kuhl's elaboration on

the many dimensions of self-regulation highlights the importance of examining each aspect of goal pursuit carefully.

Self-regulation has been applied across social, developmental, and educational psychological disciplines to explain the pursuit and maintenance of goals. Currently, extensive research has considered the cognitive, behavioral, and motivational components of goal pursuit. However, less attention has been given to the emotional strategies that are used to direct goals. Because self-regulation represents a broad and multifaceted construct, research has begun to distinguish among the different types of self-regulation. For example, self-regulation has been hypothesized as an umbrella construct for theories such as emotion regulation, affect regulation, and coping (Gross, 1998). This manuscript focuses on emotion regulation as a distinct subdivision of broader theories of self-regulation that involves the ability to control emotions in terms of their level of arousal and intensity (Saarni, 1990). It includes “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals” (Thompson, 1994: 101). From this perspective, one can conclude that goal attainment is a central definitional feature of emotion regulation.

Focusing on emotion regulation allows for the examination of strategies used specifically to alter the immediate emotional responses that can occur in academic settings. Broader self-regulatory strategies, such as task-focusing and time management, emphasize cognitive and behavioral strategies that can be implemented over time. Emotion regulation, however, involves the processes that alter immediate emotional responses during academic situations such as test taking, facing challenging tasks, and

working in group contexts. Although much of the literature on self-regulated learning has examined other aspects of self-regulation, such as motivation, cognition, and behavior, little attention has been given to the role of emotion regulation (Shutz, 2002; Wolters, 2004). This construct adds to the field, particularly with regard to achievement contexts, because it emphasizes a student's ability to intervene and modify emotional responses during stressful academic situations.

Defining Emotion Regulation

Normally, our emotional responses serve us well and are adaptive. Our emotional responses tend to be in line with our experiences and signal problems to us as well as help us to continue our engagement (Gross, 1998). An important caveat raised by Gross is that at times, our emotional responding may not always lead to the most adaptive response. Inappropriate emotion responses can occur for two reasons: "(1.) because we have misunderstood the situation or (2.) because the solution provided by our emotional responses is insensitive to the important particulars of the situation" (p. 6). This second point may be useful when understanding emotion regulation in academic settings. When emotional responses do not fit the current situation, individuals generally try to intervene, or change their emotional responses. This is known as emotion regulation, which is defined as a process in which individuals have an emotional experience and shape the timing, intensity, and expression of the emotions they experience (Gross, 1998; Cole, Martin, & Dennis, 2004). These processes can be either automatic or controlled as they can represent either conscious or unconscious acts. Individuals may be motivated to regulate their emotions for personal reasons if they find their emotions painful or harmful (Niedenthal, Krauth-Gruber, & Ric, 2006). They may also be motivated by social

reasons if they believe that their emotions will have negative implications for their relationships with others or that their emotion expression violates social customs and norms (Niedenthal et al., 2006).

There are currently two dominating theories concerning the manifestation of behaviors that regulate emotions. The first perspective, adopted by developmental psychology, purports that emotion regulation is a process that develops in infancy and changes as children acquire advanced cognitive functioning and knowledge about their emotional experiences. The second view, rooted in social psychology, depicts emotion regulation as an index of individual differences in tendencies to control emotional experiences. Taken together, these two research traditions explain the mechanisms by which emotion regulation operates in infancy and through childhood and adolescence. In order to synthesize these areas and draw conclusions for emotion regulation among early and mid-adolescents, both perspectives will be reviewed.

Development of Emotion Regulation

Emotion regulation emerges as a skill critical for social development as a child's ability to control his/her emotions is related to multiple aspects of social functioning (Hessler & Fainsilber Katz, 2007). It has been viewed as a process that organizes psychological schemas such as attention and cognitive functioning (Cole, Martin, & Dennis, 2004) as well as social processes such as social competence and peer relationships (Dodge, 1991). In this literature, researchers place an emphasis on the role of emotions as dynamic forces that impact the attentional and cognitive strategies that individuals employ to overcome obstacles, solve problems, and facilitate social interactions. Conversely, when emotional responses are maladaptive, they can impair

reasoning and planning, as well as cause complications for social interactions (Cole, Martin, & Dennis, 2004). Therefore, emotion regulation is a tool that children learn to employ so that they can have enhanced social functioning.

Across development, children acquire an increasingly complex repertoire of skills for regulating their emotions (Reijntjes et al., 2006). During infancy, emotion regulation has been operationalized as an autonomous construct; therefore, researchers have examined infant gaze aversion and self-soothing, which includes thumb sucking (Diener & Magelsdorf, 1999; Reijntjes, Stegge, Terwogt, Kamphius, & Telch, 2006). In infant populations, common indices of emotion regulation include physiological markers such as heart rate and cardiac vagal tone (Porges, 1994; Thompson, 1994) as there are limited mechanisms for assessing the use of emotion regulation in such populations. Beginning between ages two and five, as children's cognitive, motor, and language skills increase, emotion regulation incorporates behavioral strategies as children begin to use strategies such as helping and distraction (see Diener & Magelsdorf, 1999 for a review). These strategies continue through early childhood and, again, observational and physiological measures are used to determine emotion regulation. However, as children enter middle childhood, they begin to incorporate cognitive forms of emotion regulation such as reappraisal (Reijntjes et al., 2006). As such, researchers are able to determine the use of emotion regulation through self-reported emotions.

Characterization of Emotion Regulation

Because emotion regulation is so varied in childhood, developmental research has examined this construct with regard to four main characterizations (Thompson, 1994). These characterizations include dampening a negative mood or increasing a positive

mood, the socializing agents that influence emotion regulation, the ability to enhance or subdue emotions, and the dependence of emotion regulation on the individual's goals.

Dampening a negative mood or increasing a positive mood. First, emotion regulation can involve either dampening a negative mood, increasing a positive mood, or maintaining a baseline level of functioning (Thompson, 1994). This characterization is concerned with the valence of the emotion (positive or negative) and separates emotion regulation from the coping literature, which generally places an emphasis on the *behavioral* mechanisms for reducing negative emotions and moods (Gross, 1998; Carver & Scheier, 1989). Dampening a negative mood or emotional experience may be critical in the context of a performance-approach goal. As performance-approach goal orientations have sometimes been associated with negative emotional responses (Linnenbrink & Pintrich, 2002), students who endorse this orientation may encounter situations in which they have to reduce negative emotional responses. In academic settings, test anxiety is an excellent example of a debilitating emotion that performance-approach students may encounter (Elliot & McGregor, 1999). In addition, one can imagine that a cascading array of emotional experiences are possible in test-taking situations, such as frustration and worry about the test and potentially response-focused emotions such as hopelessness and shame (Elliot & McGregor, 1999). Current research on emotions in education provides some support for the notion that negative emotions such as frustration, anxiety, sadness, and boredom may also interfere with cognitive processing and learning (Linnenbrink & Pintrich, 2002b; Linnenbrink, Ryan, & Pintrich, 1999; Pekrun et al., 2002). Therefore, failure to regulate emotion by dampening negative

moods may be harmful in the pursuit of performance-approach goal orientations because it impedes a student's ability to focus on the task at hand.

Socializing agents influence emotion regulation. The second characterization of emotion regulation postulates that the processes involved are not limited to the individual and do not occur in a vacuum, but rather are a product of the context and other socializing agents involved (Thompson, 1994; Graziano, Reavis, Keane, & Calkins, 2007).

Extensive research has examined how socializing agents, namely parents, peers, and teachers, influence the emotion regulation of children. Although emotional response tendencies become crystallized in adulthood, a child's skills for regulating emotions are susceptible to influence by socializing agents, namely parents (Diamond & Aspinwall, 2003). In a study of the relationship between parent emotional expressiveness and child emotion regulatory capacity, Cumberland-Li et al. (2003) found that mother's emotional expressiveness was predictive of emotion regulation capabilities of their children.

Indeed, a child's skill for regulating emotions has consequences for his/her interpersonal relationships. Children who have better emotion regulation skills have greater social competence and peer popularity, while those with poorer skills are likely to exhibit greater externalizing symptomology, such as fighting and hyperactivity (Dodge et al., 1996).

Expanding this characterization to achievement goals, parents, teachers, and peers can serve as socializing agents toward the emotion regulation strategies that children use when they adopt performance-approach goal orientations. Parents can indirectly influence the emotion regulation strategies that their children adopt. In performance-approach oriented home environments, parents may encourage their children to attain

high grades and test scores. In addition, they may attribute the attainment of high marks to their child's ability and intelligence. Children are susceptible to making the same attributions when they encounter both success and failure on academic tasks. Attributing failure to ability has been linked to emotional experiences such as shame and hopelessness (Weiner, 1985). Shame and hopelessness are potentially debilitating emotions that can cause students to disengage from tasks and withdraw future effort (Diener & Dweck, 1978). Failure to regulate the experience of hopelessness and shame after a disappointing performance can interfere with not only cognitive processing and learning, but can cause students to disengage from future tasks.

Emotions can be subdued or enhanced. Third, emotion regulation can differ depending on the emotional experience as there is no preset or ideal manner in which to regulate. This characterization has to do with intensity, rather than the valence (negative or positive), of the emotion. Emotions may need to be subdued or enhanced, depending upon the situation. When considering the debilitating emotions that students encounter in academic situations, it becomes apparent that these emotions can vary in their intensity and duration. In addition, it may be the case that debilitating emotions such as test anxiety may only need to be subdued to a certain degree. Some evidence demonstrates that not all anxiety is debilitating as moderate levels of anxiety can serve to motivate optimal performance.

Emotion regulation depends on an individual's goals. Finally, Thompson's fourth characterization notes that emotion regulation will vary across situations depending upon the individual's goals for that situation. Strategies for regulating emotions may change depending upon the social environment. Whereas concealing

emotions such as hopelessness, shame, or distress may be beneficial in classroom settings, students may feel less inclined to hide these emotions at home. Alternatively, these emotional experiences may still shape the types of emotion regulation strategies that students use in academic settings. This final conceptualization of emotion regulation, which considers an individual's goals, guides the prevailing questions posed in this dissertation. In particular, emotion regulation is considered in the context of performance-approach goals to identify how these goals influence a student's attempt to regulate his or her emotions in academic settings.

Individual Differences in Emotion Regulation

A key feature of Gross' definition of emotion regulation is the ability to intervene and modify emotional responses when individuals sense a mismatch between the way that they respond to situations and their reactions (physiological, behavioral, neurological, etc.). While acknowledging that a bevy of emotional responses exist, Gross notes that the malleability of our emotional response modes allows us to regulate our responses to match our goals for a particular situation (Gross & John, 2003). This view portrays emotion regulation as a flexible response mechanism whereby individuals readily change emotional responses in accordance with the situation.

Gross and John (2003) distinguished between two main emotion regulatory processes: antecedent-focused, which emphasizes *reappraisal*, and response-focused, which focuses on *suppression*. Whereas antecedent-focused emotion regulation occurs before emotions have been aroused and triggers a change in behavior, response-focused emotion regulation occurs after the emotion has been activated. This distinction can be useful in academic settings. For example, a student might engage in reappraisal by

viewing a poor test grade as an opportunity to work on mistakes and prepare for the next exam. On the other hand, suppression includes the strategies that are utilized after an emotional experience that serve to conceal the experience. In an academic setting, students may feel the need to suppress their emotions when they encounter a challenging task. Instead of becoming overly anxious, some students may tend to conceal the anxiety by pretending not to care about the task or disengaging from the task altogether or, more productively, by focusing on the task and concentrating.

Another important aspect of research on emotion regulation is the link between emotion regulation and cognitive processes, affective experiences, and performance (Gross & John, 2003; Richards & Gross, 2000). This work may be especially important for understanding the role of emotion regulation in academic settings. Generally, the results have shown reappraisal to be a more adaptive form of emotion regulation as compared to suppression (Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Gross & John, 2003; Richards & Gross, 2000). Reappraisal is positively linked to short term and long term health outcomes, positive affect, and cognitive outcomes; in contrast, suppression results in unhealthy outcomes for overall well-being (Oliver and Gross, 2004). Furthermore, in a study measuring memory retrieval after a negative-emotion eliciting film, Richards and Gross (2000) found that participants who engaged in higher levels of suppression performed less well on a memory retrieval task. Those who engaged in reappraisal performed better, suggesting a cognitive cost associated with engaging in emotion regulation (Gross, 1998; Baumeister, 2000). Many studies have begun to document a link between the use of suppression and hampered task performance (Egloff et al., 2006; Tyson & Linnenbrink, 2006).

Distinctions among Sub-Disciplines

The Gross (1998; 2003) and Thompson (1994) perspectives are the predominant theoretical and empirical frameworks from personality/social and developmental psychology, respectively. These two perspectives result in two distinct lines of research: one that focuses on processes relating to the emergence and development of emotion regulation in young children and one that focuses on distinctions among the types of emotion regulation and the adaptiveness of such processes. It is important to consider both perspectives for several reasons. First, the Thompson perspective represents emotion regulation as the construct most commonly conceptualized, which involves calming down when angry, minimizing frustration, and, essentially, reducing the intensity of debilitating emotions. This perspective identifies emotion regulation as a mechanism for decreasing debilitating emotions. This definition of emotion regulation has been extensively studied with younger populations, from infancy to kindergarten.

Gross' perspective, on the other hand, examines the relative adaptiveness of established forms of emotion regulation; individuals can either regulate by reappraising or suppressing emotions. Here, emotion regulation encompasses more than the behavioral responses for calming down when angry (i.e., engaging in a new task to divert attention) as it also includes the cognitive processes involved in minimizing the experience of anger (i.e., reframing the arousal provoking situation). There is a gap in the literature that leaves out school age experiences with emotions and emotion regulation (elementary and middle school) when children are predominantly in school and learn the bulk of their emotion regulation strategies. Thus, we need both perspectives to consider how students make the transition from simply experiencing emotions and

automatically regulating them to a point in their lives when they have a meta-cognitive awareness of their interpretation of emotions.

Commonalities

The social and developmental literatures have presented solid conceptual frameworks for understanding the role of emotion regulation in achievement goal pursuit. Four themes (presented in each of their theoretical models) overlap, lending credence to a strong conceptual definition of emotion regulation in an achievement context. The first of these themes is the capability to intervene to change emotional responses. Gross identifies these critical points of intervention as antecedent-focused and response-focused emotion regulation, whereas Thompson notes the ability to modify responses in his central definition of emotion regulation. The second theme regards the flexibility of emotional regulatory capability. Both indicate that it is almost impossible to innumerate the myriad of emotional regulatory strategies as the situation will dictate the strategies that need to be utilized. Third, both acknowledge the dynamic nature of emotion regulation as it can occur to increase positive emotion, decrease negative emotion, or to restore emotions to a baseline level of functioning. Finally, both acknowledge that social and contextual factors serve to facilitate regulation, whether the context is environmental or other socializing agents.

Evidence from the developmental and social literatures provides a conceptual framework for examining emotion regulation in academic contexts. This foundational work has led to the identification of strategies that students use to regulate emotions in a myriad of settings, including relating with peers (Reijntjes et al., 2006) and adjusting in academic settings (Schutz, 2001). Drawing on these two theories, research has begun to

examine how specific emotion regulation strategies operate in the classroom (Schutz, 2001; Schutz, DiStefano, Beson, & Davis, 2004; Schutz, Hong, Cross, & Osbon, 2006). A review of the strategies identified in classroom settings will provide insight about how these constructs relate to the pursuit of performance goals in school.

Regulating Debilitating Emotions in Academic Contexts

Recently, emotion regulation has been explored as an independent predictor of achievement related outcomes such as standardized test performance, grades, and classroom learning (Graziano, Reavis, Keane, & Calkins, 2007). Whereas the majority of the studies that focus on emotion regulation are based on kindergarten children, this work suggests pathways for understanding how debilitating emotions appear in academic contexts and how students can regulate them. This section will review the literature on emotion regulation in achievement contexts to identify the regulatory strategies that students employ and the utility of these strategies across the lifespan. This evidence will also clarify how emotion regulation can be studied and measured in early adolescents, a group that has received little attention in this area.

In a study of emotion regulation among kindergarten students, items included “Controls temper in conflict situations”, “Compromises in conflict situations”, “Is nervous, high strung or tense”, and is “easily frustrated”. Not only do these items reflect emotion regulation for children near age 5 and 6, they may also reflect indices of regulation that school-age children can accurately report as conflict, frustration, and nervous experiences are common through middle school. Additionally, measuring similar items, Graziano et al. (2007) explored the role of emotion regulation in academic success for kindergarten students. They found that emotion regulation significantly

predicted academic success on achievement tests and teacher measures of success and productivity in the classroom. These effects remained even when controlling for IQ. Although this study provides evidence of a relationship between emotion regulation and academic success, the cross-sectional design did not allow for a test of the long-term effects of such a relationship.

Although less is known about emotion regulation in middle school populations, there is broader evidence about the cognitive changes that may lead early adolescence to develop their emotion regulation strategies and tactics. Broadly, as early adolescents increase in their levels of cognitive meta-awareness, they may be able to do more forecasting and predicting concerning their academic achievement. Alternatively, this increased awareness could also lead early adolescents to rely more on rumination and other less adaptive strategies. While little is known about emotion regulation in adolescence, research in this area would identify the role that emotional experiences play for this age group.

The most pertinent evidence about the role of emotion regulation in academic contexts may come from exploratory research that has investigated self-reported strategies that arise during test taking. Drawing from the frameworks presented by both Gross (1998; 2002) and Thompson (1994), Schutz and Davis (2000; 2006) have identified four categories of emotion regulation strategies: 1.) cognitive appraising processes, 2.) task focusing processes, 3.) processes involved in regaining task focus, and 4.) emotion focusing processes.

Cognitive appraising processes directly map onto the reappraisal strategies outlined by Gross. In general, this strategy involves the way in which students appraise

test-taking situations. A student may engage in cognitive appraising by thinking about how a test is helping the student to reach his or her goals for a class. If the goal is to be a successful student, cognitive appraisal can allow the student to think about how they are progressing on the test or the degree to which they can control the grade that they receive. *Task focusing processes* are the strategies that students use to maintain their focus on the test. During a test, a student may try to block out distracting thoughts that can cause negative emotions, such as the thinking about implications of failure. Strategies used for *regaining task focus* are enacted so that students can directly manage the emotional experience by either dampening negative or positive emotions or establishing a baseline level of emotion responding, which are critical points derived from Thompson's (1994) theory. This strategy includes tension-reduction attempts and reappraising the importance of the test. These processes include a student's attempts to focus on the current task and eliminate potential harmful negative emotional experiences such as anxiety. The strategies for cognitive appraisal, task-focusing, and regaining task-focus are intertwined as they all involve reasoning about an individual's test progress to reduce the impact of emotional experiences. Indeed, these strategies are purported to possess a positive association with general test performance (Schutz, 2006).

Emotion focused processes, on other hand, are strategies that involve a focus on the self and the emotions that arise during the test. These strategies are similar to suppression because they involve specific attempts to conceal true emotions. These strategies involve disengaging from a test completely or criticizing oneself for not being better prepared. Emotion focused processes are associated with increased anger and anxiety (Schutz, 2006).

Recently, Schutz (2002) examined the role of emotion regulation during test-taking situations among undergraduate students. In a preliminary study, Schutz identified college students who exhibited low, moderate, and high levels of test anxiety. Students were asked to rate the extent to which emotions (unpleasant vs. pleasant) related to both task-focused and emotion-focused processing. Individuals who were characterized as having low to moderate levels of test anxiety reported little to no relationship between emotional experiences and either task-focused or emotion-focused processing. However, those students who reported high levels of test anxiety viewed their emotional experiences and task-focused processing as highly related and intertwined. For example, these students were likely to rate items such as ‘analyzing questions’ and ‘feeling frustrated’ as experiences that go hand in hand. Although a retrospective analysis that required students to recall emotional experiences, this study indicates that debilitating emotions are likely to co-occur during tests for some students. Moreover, anxious students presented an attentional bias toward threat. In a similar manner, performance-approach students are vulnerable to messages about self-threat because they focus on demonstrating their competence. It may be the case that performance-approach students who experience anxiety perform less well when they are unable to control their anxiety and self-threat and fail to use task-focused processing.

Reviewing the few studies that link emotion regulation and academic achievement highlights several avenues for future research. First, emotion regulation has been extensively studied across early childhood and adulthood (Reijntjes et al., 2006). Second, within achievement contexts, the research that focuses on the regulation of specific debilitating emotional experiences is scant. Therefore, further work should investigate

the prevalence of emotion regulation for school age children from middle childhood to early adolescence.

INTERACTION: EMOTION REGULATION AND PERFORMANCE-APPROACH ORIENTATIONS

Emotion Regulation and Achievement Goal Orientations

The pursuit of achievement goals requires an individual to assess academic situations and evaluate them in terms of their importance. These are both processes in which emotions play a critical role because emotions reinforce and modify how individuals strive toward goals. The ability to regulate these emotions may explain why individuals choose to stop or continue striving toward achievement goals. Emotions that arise as part of the response to achievement contexts may also vary as a function of the type of goal one is regulating toward (Linnenbrink & Pintrich, 2002; Carver & Scheier, 1990). Indeed, preliminary evidence of the role of emotion regulation in the context of achievement goals showed that there is a relation between these variables. In a study of 78 4th grade students from a southeastern, semi-urban school district, students reported on the goal orientations perceived in their home environment and parents reported on the child's ability to regulate their emotions. The results indicated that in environments low in mastery goal endorsement, reports of low emotion regulation were associated with lower standardized test scores in comparison to students who were reported to have higher emotion regulation skills (Tyson, Adams, & Hill, 2005).

Drawing upon these findings as well as then extant literature, I argue that the consideration of emotions and emotion regulation is critical to understanding how and why achievement goal orientations, especially the endorsement of the performance-approach orientation, relate to academic outcomes and may explain the contradictory findings for the relation between performance-approach goals and achievement.

Although both performance-approach and performance-avoidance goal orientations are likely to be linked with the experience of debilitating emotions, we argue that experiencing debilitating emotions and regulating these emotions may be especially critical for understanding how performance-approach goals relate to various outcomes and may explain the seemingly contradictory findings between performance-approach goal orientations and achievement. First, there is evidence to suggest that not all students experience the same pattern of emotions while pursuing performance-approach goals (see Linnenbrink & Pintrich, 2002 for a review). Furthermore, there is preliminary evidence that suggests that when the amount of negative emotion that a person experiences is held constant, performance-approach goals may be especially adaptive for cognitive functioning (Linnenbrink et al., 1999). As such, it seems likely that individuals pursuing performance-approach goals may better utilize their resources and benefit from a performance-approach goal orientation if they are able to reduce their experience of debilitating emotions. This would not be the case for performance-avoidance goal orientations as an avoidance orientation is unlikely to lead to beneficial academic outcomes, regardless of one's emotional responses because they are less likely to engage in achievement tasks. Furthermore, since mastery goal orientations are not associated with debilitating emotions, it is unlikely that emotion regulation would moderate the relation of mastery goal orientations to academic outcomes. As such, we focus our discussion here on how and why emotion regulation might moderate or explain the relation of performance-approach goals to academic outcomes, especially the contradicting findings regarding the nature of the relation between performance-approach and achievement. To explain the contradicting findings, I propose the PARE Model

(Figure 1, Performance-Approach and Regulation of Emotion), which depicts the moderating role of emotion regulation in the relationship between performance-approach orientations and achievement outcomes, in addition to the socialization processes that shape goal orientations and emotional experiences in academic settings (Tyson, Linnenbrink-Garcia, & Hill, in review).

**THEORETICAL MODEL & RESEARCH QUESTIONS:
Performance-Approach and Regulation of Emotion Model (PARE)**

Consideration of Socialization Processes

First, we consider the social contexts that lead to or are associated with students' endorsement of performance-approach goal orientations and their emotional responses. As such, we turn our attention to the left side of the model to consider how both home and school environments shape students' personal goal orientations and debilitating emotions (see Figure 1). I also include theories of intelligence in the model as both home and school environments have the potential to shape the types of attributions that students make and, thus, alter their goal orientations and experience of debilitating emotions. Additionally, when looking at attributions for prior achievement, I am focusing on the theories of intelligence that students adopt because these theories are purported to precede and reinforce adherence to goal orientations (Cain & Dweck, 1989; Grant & Dweck, 2003; Mueller & Dweck, 1998).

Starting at the immediate left with classroom goal structures, the role of the classroom environment contributes to performance-approach goal orientations directly and indirectly through theories of intelligence. Specific classroom goals can result in performance-approach goal orientations (Ames & Ames, 1984; Ames, 1992; Maehr & Midgely, 1991; Maehr & Anderman, 1993). For example, the characteristics of elementary, compared to middle, school classrooms may account for an increase in the endorsement of performance-approach goals at the middle school level (Eccles, 2004). In particular, middle schools tend to highlight social comparison by publicly displaying grades and emphasizing the relative status of students through honor rolls or other academic awards (Maehr & Midgely, 1991), which is exacerbated by the developmental

changes in peer relations and identity formation that heightens social comparison among peers during adolescence (Hill, Bromell, Tyson, & Flint, 2007). Making normative performance salient causes students to judge their own performance relative to peers. If students interpret successfully outperforming peers as indicative of their own ability and, in turn, attempt to perform well in order to surpass their peers, this can often lead to the adoption of performance goal orientations (Ames, 1992). Consequently, if these students do not successfully outperform their peers, they can interpret failure as indicative of a lack of ability. As such, it is hypothesized that classroom goal structures are associated with the adoption of performance-approach orientations.

Specifically, researchers suggest that key elements of the classroom such as the tasks that are employed (e.g., timed math tests), the authority structure (e.g., teacher as the evaluator and authority figure), and the recognition and evaluation practices (e.g., grading on a curve) can impact students' perceptions of the classroom as emphasizing performance goal orientations (Ames, 1984; 1992). For example, an emphasis on public classroom evaluation, such as announcing highest and lowest grades and grouping students by ability, can cause students to judge their relative standing compared to other students as indicative of their ability. Indeed, during the transition to middle school, there appears to be a developmental shift during which children begin to understand ability as a potentially stable trait and begin to define it as such (Dweck, 2002). The rise in entity views of intelligence and increase in classroom dynamics that emphasize performance can lead to the adoption of performance-approach orientations.

In addition to the direct link between school or classroom structures and performance-approach goal orientations, theories of intelligence can also mediate this

relationship. Public evaluation in classrooms encourages students to make attributions about their ability when they encounter both success and failure. Attributing success to ability and relative standing compared to peers can have a particularly detrimental impact when students do not perform well (Dweck & Leggett, 1988; Mueller & Dweck, 2003). In the case of failure, if a student attributes poor performance to their ability, the result can be negative perceptions of their future capability and avoidance of challenge in future academic contexts (Ames, 1992). When students perceive their academic performance to be contingent upon their ability, they seek goals that allow them to demonstrate that ability. Indeed, attributions made about one's ability, indicated by theories of intelligence, have been linked to the adoption of performance-approach goals (Grant & Dweck, 2003; Mueller & Dweck, 1998). Due to the role of classroom goal structures in encouraging attributions of prior academic achievement, it is hypothesized that theories of intelligence will mediate the relationship between school goal structures and performance-approach orientations.

At the bottom left portion of the model is the role of the home environment in shaping performance-approach goal orientations, both directly and through attributions about a child's prior academic experiences. Parents foster the adoption of a performance-approach orientation within the home by encouraging their children to attain high test scores, inquiring about the performance of a student's classmates, and communicating with schools about ability grouping for their children. Additionally, parents can also indirectly support performance-approach orientations as they reinforce entity theories of intelligence by praising their child's intelligence or ability. Parents and students who believe that performance outcomes are paramount can create an entity theory of

intelligence when placing an emphasis on the role of a student's ability and intelligence. This type of feedback from parents can lead children to adopt performance orientations toward achievement because they are focused on demonstrating their high ability to parents and others. Parents may foster the development of learned helplessness when they evaluate the academic outcomes of their children with praises of ability rather than effort (Diener & Dweck, 1978). Specifically, when parents praise their child's ability, they endorse an entity view of achievement, which can lead to the adoption of a performance-approach orientation (given the parent's endorsement of the belief that ability is a fixed, uncontrollable, and stable trait). That is, children wish to demonstrate that they have abilities that they believe cannot be attained through effort (i.e., "God-given" talents).

Next, characteristics of both the home and classroom environments contribute to the experience of debilitating emotions. Emotional responses, particularly those that can be debilitating, are often shaped by social contexts. According to attribution theory, the manner in which success and failure are interpreted or evaluated determines the emotions that are experienced (Wiener, 1985). Generally, emotions such as happiness and pride are experienced after success, whereas frustration and displeasure are experienced after failure (Wiener, 1985). In addition to the experience of success or failure, the specific causal ascriptions for success and failure lead to emotional responses. For example, blaming a failure on an internal, stable, and uncontrollable cause such as ability would result in debilitating emotions such as of hopelessness and shame (Brown & Weiner, 1984; Weiner, 1985). In academic settings, the primary attributions that have been documented to impact perceptions of success and failure are attributions concerning

one's effort and ability. Therefore, I consider theories of intelligence as an appropriate theoretical lens to examine how children view their own intelligence.

Both the classroom structure and home environment can each independently influence the experience of debilitating emotions through theories of intelligence. As in prior examples of classrooms and homes that endorse performance-approach goal orientations, students who endorse these goals are susceptible to attributing their academic performance to their ability. Performance (approach) oriented students are concerned with validating and measuring their ability. This can lead to positive emotional responses such as pride and joy, particularly when students are performing well or when they achieve their goal of demonstrating their competence to others. However, in accordance with this interpretation of performance-approach goals, negative academic outcomes can imply that a student lacks the ability to attain success (Grant & Dweck, 2003; Heyman & Dweck, 1992). Additionally, attributions about ability, particularly when ability is low, can lead to an array of negative (and potentially debilitating) emotional experiences such as rumination about low ability, learned helplessness, a decline in intrinsic motivation, or withdrawal of effort as they believe it will not yield academic benefit (Heyman & Dweck, 1992). Several studies have linked attributions about ability after the experience of failure to negative affect (Butler, 1987; Heyman & Dweck, 1992; Cain & Dweck, 1995; Grant & Dweck, 2003).

Collective Effects of Home and School Orientation

In addition to the unique effects of home and school goal orientation on student outcomes, it is possible that the combination of home and school influences can play an important role in the way students experience emotions in academic contexts. As such, it is hypothesized that the concordance between school and home performance environment can lead to the experience of debilitating emotions. Research has begun to consider two possible combinations of home and school environments as they impact student outcomes. One possibility is that home and school orientations can be different, sometimes resulting in dissonance between the messages sent by home and school. An alternative possibility is that the presence of either contextual orientation can serve as a protective factor in the presence or absence of the other.

Home/School Dissonance

Little research has explored the dual influence of the home and school goal orientations and their joint impact on student outcomes. For example, if a school emphasizes mastery goals, while parents endorse performance-approach goals, it is not clear which goals students are more likely to pursue or how the dissonance affects achievement. Within educational settings, achievement researchers have considered the possibility that opposing views exist between the home and school environments regarding values and expectations for education. Whereas families and schools may possess different educational beliefs and values, these differences do not always lead to conflict. However, a lack of concordance can be stressful, as students are faced with competing messages.

For some students, dissonance between home and school academic values can cause conflict surrounding one's own academic identity. From a developmental perspective, experiencing conflict concerning one's academic identity is a normative occurrence. Generally, the experience of contradictory messages concerning one's identity arises during early adolescence, peaks during mid-adolescence, and declines in late adolescence (Harter, Bresnick, Bouchey, & Whitesell, 1997). Students who experience high dissonance between home and school values experience stress, anxiety, anger, hopelessness, depression, and low self-esteem (Arunkumar et al., 1999; Harter, et al., 1997), which are all emotions that can be considered debilitating. However, students who do not experience dissonance between home and school values, successfully negotiating the two environments, do not suffer from the same debilitating emotions, particularly across the transition to middle school (Arunkumar et al., 1999).

Achievement goal orientations may represent a potential source of dissonance between home and school for many students, particularly as they transition to middle school. During elementary school, it is most likely that home and school environments will be in accordance in their endorsement of mastery goals (Arunkumar et al., 1999). The elementary school environment is predominantly mastery oriented, where teachers emphasize learning and understanding. Simultaneously, at home, parents predominantly encourage their children to learn new skills and concepts. Additionally, elementary school teachers have greater opportunities for contacting parents and getting to know individual students, which may allow them to understand values within the home (Arunkumar et al., 1999). However, in middle school, the school environment becomes more performance oriented as social comparison becomes more prevalent, students are

frequently judged against their prior performance, and grades and test scores matter for future success. If an appropriate shift or explanation does not occur in the home environment, this change in the school context may result in a mismatch between the home and school environments. When dissonance exists between the home and school environments, students who are unable to resolve the conflict may be more likely to experience emotions that can impede cognitive performance. For example, if a mastery goals orientation is emphasized within the home while performance goals are emphasized at school, students may experience increased debilitating emotional responses.

Protective Influence of Home or School

In addition to conflicting contextual messages about goal orientations, it is also the case that the opposing messages can prove beneficial for students. Current work suggests that parent involvement that emphasizes a mastery-oriented focus can buffer the negative effects often associated with performance oriented contexts. In a study of 10-12 year olds transitioning into middle school, children who's mothers used mastery oriented strategies in their homework help (i.e., encouraging children to solve problems on their own and encouraging effort and understanding) had children who were resilient against the negative self-perceptions of academic competence that children experienced who did not receive mastery-oriented help with their homework (Pomerantz et al., 2005).

Similarly, in a study of both student goals and parent goals across the transition to high school, when parents endorsed mastery goals more than performance goals, students experienced positive changes in academic self-efficacy and other motivational variables (Gutman, 2006). These studies demonstrate that endorsement of mastery oriented goals at home can serve as a protective factor against the negative consequences associated

with the performance oriented environment of middle and high school contexts. They may also suggest that protective effects of differential home and school goal orientations can serve as a buffer against the experience of debilitating emotions because the protective benefits of one environment reduced the negative attributions about prior performance (Pomerantz et al., 2005) and enhanced the positive attributions about prior performance (Gutman, 2006). As previously noted, attributions concerning prior achievement and theories of intelligence are able to shape emotional responses, potentially causing debilitating emotions when attributions are made about a student's ability. In summary, it is hypothesized that home and school environments can collectively influence the experience of debilitating emotions, as demonstrated in the model.

To summarize, the research questions are as follows:

1. Is the classroom goal structure directly associated with the endorsement of a performance-approach orientation?
2. Is the relationship between classroom goal structure and performance-approach goals mediated by a student's theories of intelligence?
3. Are goal orientations fostered at home directly associated with the endorsement of a performance-approach orientation?
4. Is the relationship between home goal orientation and performance-approach goals mediated by a student's theories of intelligence?
5. Are classroom goal structure and home goal orientation collectively associated with emotional responses, particularly debilitating emotions?

Personal Goal Orientations and the Impact on Emotional Responding and Achievement

Looking at the right side of the model, we focus our attention on the relationship between performance-approach orientations and academic achievement to consider how personal goal orientations impact emotional responses. According to the model, a performance-approach orientation will be associated with academic achievement. It is hypothesized that endorsement of a performance-approach orientation will be positively related with achievement outcomes because performance-approach orientations place an emphasis on demonstrating the presence of one's competence and ability to others. Indeed, performance-approach orientations can be positively associated with achievement outcomes because when students endorse this goal orientation, they focus on trying to do their best in school, either for competitive (i.e., performing better than other students) or appearance-related reasons (i.e., looking smart).

However, as previously noted, one source of debate within the literature has been the inconsistent relationship between performance-approach orientations and achievement outcomes. As noted above, performance-approach goal orientations show a positive, negative, and unrelated association to achievement indices such as cognitive engagement and effort. I propose that the inability of performance-approach goal orientations to consistently predict achievement is due to a lack of examination of the role of debilitating emotions that some of these students experience. Some evidence suggests that performance-approach orientations are linked to unpleasant and often debilitating affective experiences such as anxiety and frustration (Linnenbrink & Pintrich, 2002; Linnenbrink, 2007). Therefore, it is hypothesized that performance-approach orientations are linked to an array of emotional responses. At times, performance-approach goals can

lead to positive emotional responses as they have been linked to the experience of pride (Pekrun, Elliot, & Maier, 2006). In general, it is plausible that pursuing performance-approach goals would be linked to positive affect because students who adopt this orientation want to do their best and appear smart in class. In turn, if those goals are met, they should experience positive affect in response (Sideridis, 2005). In light of the potential positive emotional experiences, it is also the case that debilitating emotions can arise for performance-approach students in academic contexts, particularly when they sense threats to their attempts to demonstrate competence. Additionally, it is hypothesized that of the emotions students experience in academic contexts, those that are debilitating (i.e., anxiety and fear) are particularly detrimental and likely to arise for students that endorse performance-approach orientations because their ability is on the line. When these students are unsuccessful at achieving their goals of demonstrating competence, it may reinforce the idea that they do not possess certain competencies. Failure to control these debilitating emotional responses may be the cause of the negative or null relationships between performance-approach goal orientations and achievement outcomes. Similarly, regulating debilitating emotions may enhance achievement outcomes when students adopt performance-approach orientations, explaining the positive association between performance-approach and achievement in some samples.

In this model, it is hypothesized that when the experience of debilitating emotion activates emotion regulation, the relation between performance-approach goal orientations and achievement outcomes is positive. That is, emotion regulation is hypothesized to be a moderator of the relation between performance-approach goal orientations and academic outcomes such as class test scores (see Figure 1). Here, the

achievement outcomes of interest are class test scores, such as quizzes and cumulative math exams, because test taking has been shown to elicit strong emotional responses (Covington et al., 1986; Schutz, 2002). As such, emotion regulation is necessary to reduce the effect of debilitating emotions on academic achievement. For example, when pursuing performance-approach goals during at test, a student may encounter anxiety. However, if a student enacts the proper emotion regulation strategies (such as reappraising the test taking situation or calming down in order to focus on their initial goal of performing well) rather than endorsing threatening test-related cognitions (Schutz & Davis, 2000), this student can reduce the focus on his or her anxiety and, perhaps, approach the test in a more adaptive manner. Here, emotion regulation may be acting as a moderator of the relationship between a performance-approach goal orientation and test outcomes. Conversely, if the same performance-approach oriented student does not regulate his or her emotions during the test, the experience of anxiety is likely to have debilitating effects on test performance.

Indeed, all emotional responses to an achievement context may not be debilitating or negative. The endorsement of a performance orientation may lead to an increased focus and confidence that provides a competitive edge. It is only the debilitating emotional responses that are problematic and result in undermining achievement outcomes. In addition, those students who both endorse a performance-approach orientation and a fixed view of their intelligence may be more likely to experience debilitating emotions because failure in academic context will not only indicate a lack of competence, but these students may also view themselves as simply lacking intelligence in a given subject. Further, debilitating emotions need not only be negative (e.g.,

anxiety), over-confidence, over-excitement, and pride may be equally debilitating. As such, one characteristic of emotion regulation that is critical to understanding its role with respect to performance-approach goal orientations is that emotion regulation is not simply involved in dampening negative emotions (Thompson, 1994). For performance-approach goal orientations, emotion regulation may be employed to dampen anxiety and frustration when students encounter challenge or difficulty. However, it may also involve dampening overexcitement and pride, which may emerge when students feel they are successfully approaching their goal of outperforming others. This dampening of positive emotions may be important as well as intense, activated positive emotions may interfere with one's focus and engagement.

To summarize, the research questions are as follows:

1. Are performance-approach orientations positively associated with achievement outcomes?
2. Are performance-approach orientations linked to the experience of debilitating emotional responses? If so, is this link stronger for students who endorse an entity theory of intelligence?
3. When the experience of debilitating emotions activates the use of emotion regulation strategies, is the relationship between performance-approach goals and achievement outcomes positive?

PILOT STUDY: TESTING THE RIGHT PORTION OF THE PARE MODEL

Overview & Premise of Research Design

A pilot study was conducted at the end of the academic year at a middle school in the southeastern United States. The pilot study was conducted to determine the feasibility of examining the aforementioned hypotheses, and to provide a preliminary evaluation of the right hand portion of the model. The pilot study was conducted during high stakes testing and examinations. Standardized testing was selected as an appropriate time to examine how the PARE model operates because high stakes test environments presume that as a result of testing, students should be motivated to perform to high standards and, in addition, these environments can elicit an array of debilitating emotional responses (Ryan, Ryan, Arbuthnot, & Samuels, 2007). Therefore, it was expected that high stakes testing would be an appropriate time to assess both performance-approach orientations and debilitating emotional experiences in middle school. The study was designed to ask students about their goal orientations, emotions, and tendencies to regulate emotions during mathematics standardized testing.

Participants were 69 seventh grade students who were assessed at two time points, During *Time 1*, students took their scheduled standardized examinations. One week after the exams, at *Time 2*, teachers administered the packets of questionnaires for students to take home. These packets included measures of (1) the general tendencies that students have for regulating their emotions (Gross, Emotion Regulation Questionnaire, 2003); (2) the motivational orientation adopted during the exam, (Patterns of Adaptive Learning Strategies, Midgley et. al, 2000); (3) the emotions experienced while working on the test (Izzard's Differential Emotion Scale, 1972); (4) the emotion regulation strategies

employed during the test (Schutz's Emotion Regulation During Test Taking Scale, 2000); and (5) a demographic information sheet that asked students to report their age, sex, ethnicity, and homeroom class. Test scores were collected from the school administrators.

Preliminary Evidence

Whereas the primary hypotheses were to determine whether emotion regulation moderated the relation between performance-approach and achievement, there was little evidence to support this claim, given the small sample size. However, there was evidence that emotion regulation strategies and emotions mediated the link between performance-approach goals and achievement. Overall, the results of this pilot study suggested a link among achievement goals, emotions experienced during testing situations, and the emotion regulation tactics that were employed. Interestingly, we found that both performance-approach and mastery-approach goals were negatively associated with achievement on standardized math tests. Though it is surprising that both goals were negatively associated with achievement, prior research suggests that these negative relationships may exist for both mastery and performance goals assessed in relation to standardized tests (Stipeck & Gralinski, 1996). It is important to note, however, that their measure of a performance orientation did not distinguish between performance-approach and performance-avoidance goals. They also found a negative relation between mastery goals and standardized achievement, but only in social studies.

In the pilot study, the negative association between both mastery goals and test scores may be due to the fact that standardized testing at the end of the school year potentially represents an achievement outcome that is not deemed of critical importance

to students, especially in comparison to other achievement indexes such as grades on class assessments and homework assignments. Additionally, it should be noted that the middle school utilized in this pilot study is classified a “priority” school, as authorized by No Child Left Behind standards, where only 50% of students exhibited math performance at or above their grade level. As such, in order to meet state requirements, students are required to take nine math standardized assessments over the course of the school year. This extensive testing environment, indeed, may fail to align with a student’ goals for developing competence in a given area; however, this finding requires further investigation. In addition, this negative relation may exist because mastery goals encourage students to develop new skills and improve, which may be in opposition to the demands of standardized tests that include time constraints and little opportunity for improvement.

With regard to the relations among achievement goals, emotions, and student achievement on the standardized tests, performance-approach and mastery-approach goals were linked in a manner consistent with prior research. That is, we found performance-approach goals were associated with increased anger and joy during the test. A review of research on affect and goal orientations corroborates these mixed findings for the association between performance-approach goals and pleasant emotions. For example, Linnenbrink and Pintrich (2002) reported that performance-approach goals were related to higher reports of unpleasant affect and seem to be either unrelated or positively related to pleasant affect. Additionally, Pekrun et al. (2006) found that performance-approach goals were linked to the experience of positive emotional experiences such as pride. Similarly, our results for mastery-approach goals suggested

that these goal orientations were associated with pleasant affective experiences, consistent with prior literature (see Linnenbrink & Pintrich, 2002; Pekrun et al., (2006).

The mediational models provide some insight into the processes that may exist here. For example, anger partially explained the negative relation between performance-approach goals and achievement. This indicates that when considering the goals that students endorsed, it was the experience of anger during the tests that partially accounted for decreased test scores. This lends partial support to my premise that the negative relations between performance-approach goal orientations and achievement outcomes may be partially due to an increase in negative emotional experiences.

Considering the link between achievement goals and the use of emotion regulation tactics, we found that mastery goals were correlated with the use of adaptive strategies, such as using tension reduction and task-focusing processes. It is conceivable that mastery goals would be related to these strategies because this goal emphasizes developing one's competence and improving, which can be achieved by focusing on the task in order to find the key material needed to solve math problems. Although there was an association, the use of such tactics was unrelated to achievement on the standardized exams. In addition, mastery goals were also linked to the use of wishful thinking, though the use of wishful thinking did not explain the negative relation between mastery-approach goals and achievement.

Performance-approach goals, on the other hand, were only associated with the use of maladaptive emotion regulation tactics such as engaging in self-blame and wishful thinking during the test. The evidence suggests that performance-approach students tended to have lower scores on the tests when they engaged in self-blame (i.e., criticizing

oneself for not being prepared for the test) and wishful thinking (i.e., wishing the test was over). It is conceivable that performance-approach students would use strategies such as self-blame because both of these processes rely on feedback about one's own progress and performance.

Finally, when examining the interplay among goals, emotions, and emotion regulation strategies, there was evidence to support mediational models. There was some evidence for the use of tension reduction as a mechanism by which students endorsing mastery goals reported feeling more attentive during the exam. Interestingly, we also found some evidence that anger partially explained the relationship between performance-approach goals and the use of self-blame. This indicates that when considering performance-approach goals, it was the experience of anger that partially accounted for students using alternative tactics to deal with that anger, such as criticizing themselves and becoming increasingly upset because they did not know the material that was on the test. Although this is not an adaptive strategy to use when trying to minimize the experience of anger, it is quite plausible that students can become angry and lose focus on the test by employing tactics that may not help them on the test, but may explain why they experience certain emotions. Interestingly, whereas debilitating emotions such as anxiety have been reviewed extensively in the test-taking literature and regarded as “natural” responses to stressful academic environments, less attention has been paid to the role that anger may play as a debilitating emotion (Boekaerts, 1994). Indeed, as Boekaerts (1994) highlights, students may experience anger in academic situations but since it is a less socially acceptable emotional experience, students are conditioned to

direct that anger inward. This lends credence to the finding that anger and self-blame are processes that can be intertwined.

In a similar manner, the experience of shock partially explained the relation between performance-approach goals and the use of wishful thinking. As students tried to demonstrate their competence, this was associated with higher levels of feeling shocked and surprised during the test, which was, in turn, associated with relying on wishful thinking during the exam. This may occur in the case in which students are surprised at the exam content; they may utilize wishful thinking as a way to deal with having to work on questions that they did not expect.

The findings for the complex interplay among goals, emotions, and emotion regulation indicated the importance of considering both emotions and emotion regulation tactics. As demonstrated in this preliminary study, we found that anger explained the relation between goals and the use of emotion regulation strategies, whereas emotion regulation strategies such as self-blame and wishful thinking explained the relation between goals and emotions. Although seemingly contradictory, these findings may shed some light on the role of emotion regulation strategies. Whereas the term “strategy” implies a technique that is *intentionally* employed, it may actually be the case that students *unintentionally* employ “tactics” that they use to deal with emotions, rather than specific strategies designed with the plan of reducing emotions. Self-blame, which is theoretically purported to be associated with heightened anger and anxiety, can be used to illustrate this point. It is quite plausible that students begin engaging in self-blame during a standardized exam when the questions seem difficult and students feel ill-prepared. Using this ‘tactic’ can conceivably elicit anger. It is also the case that students may begin

the test and feel angry because the test is difficult. In order to manage that anger (ineffectively so), students may then engage in self-criticism, which can actually incite more anger. Therefore, the models representing the link between emotions and emotion regulation may present an even more complex picture.

Implications for Testing the Proposed Model

Whereas the pilot study provided partial support for the PARE model (confirming many of the hypothesized associations), it has also sharpened the research questions for this dissertation study. There are four major aspects of the hypotheses and research design that have been refined as a result of the pilot study that will more accurately assess the model.

The first aspect of the study that will be revised due to evidence from the pilot study is the classroom context that will be used. Results from the pilot study demonstrate a negative main effect for performance-approach goal orientations on student standardized test scores. Among the few studies that have examined such motivational variables in the context of standardized testing, there is mixed evidence to suggest that there may, indeed, be a negative relationship between performance-goal orientations and standardized test scores, as indicated by Stipeck and Gralinski's (1996) study. It is important to note, however, that their measure of a performance orientation did not distinguish between performance-approach and performance-avoidance goals. In this study, the negative effect may be due to the fact that standardized testing at the end of the school year potentially represents an achievement outcome that is not believed to be of critical importance to students, especially in comparison to their final course grade.

As a result of this critical finding, I have decided to switch the focus of the study from the *standardized testing experience to testing experiences in general math classrooms*. Due to the relatively weak association between performance-approach goals and test outcomes, the dissertation study will attempt to assess goal orientations in environments that demonstrate stronger associations with performance-approach goals. As a recent review demonstrates, survey studies that find associations between performance-approach goal orientations and achievement outcomes find this effect when more proximal assessments (i.e. class tests and grades) are used as opposed to standardized achievement measures (Linnenbrink et al., 2007). Specifically, for this study, the primary achievement outcomes of interest will be math tests, including quizzes and cumulative math tests. These outcomes are of critical importance in this study because these tests will produce an array of emotional responses. While I will also collect data on final course grades, this achievement outcome is of secondary interest in this study because overall course grades are dependent on factors such as classroom attendance, participation, and work on projects in addition to math tests. Because this outcome includes math test scores, it will also be considered in the analyses.

The change in research design will result in focusing on (1) an environment that has the greatest potential to elicit performance-approach goals and (2) an achievement outcome that is believed to be of critical importance to students. In the extant literature, performance-approach goals are prevalent as students enter middle school environments (Maehr & Midgley, 1991). Thus, asking students about their experiences in their math class and about performance during math tests should satisfy these two criteria.

The second area of refinement for this study regards the developmental context within which these processes are examined. In the initial pilot study, only 7th grade students were utilized. However, the current research study will focus on multiple math classes to determine if the model applies equally across 6th, 7th, and 8th grade. Prior research indicates that 6th grade students may experience more debilitating emotions, such as fear and anxiety in failure situations, when they are first exposed to performance goal environments (Middleton et al., 2004). Therefore, when examining the 6th grade students, the model may indicate stronger associations between performance-approach goals and debilitating emotions than for 7th and 8th grade students. It is hypothesized that the model should apply equally well to both the 7th and 8th grade students, as they have been exposed to the performance-approach aspects of the school context for a longer period of time and may have acquired more skills for regulating their emotions. Moreover, in the case of the 6th grade students, it may be the case that adherence to performance-approach goals may not be as strong, or that emotion regulation strategies may not be as sophisticated as those of older students. As such, this study will explore how the model applies across grade level.

Third, although Gross' Emotion Regulation Questionnaire (ERQ) was used in this study, this individual difference measure was not associated with measures of achievement or emotional responses. It is quite possible that this particular assessment of emotion regulation is too advanced for middle school students and/or difficult to comprehend. For these reasons, this measure will not be included in the dissertation study.

The final area of refinement for the pilot study will be an assessment of ethnic differences. The literature review demonstrates some evidence that performance goal environments may be associated with more negative emotional responses for African American students than European American students (Kaplan & Maehr, 1999a). There may be stronger associations between performance-approach orientations and the experience of debilitating emotions for African American students. As such, analyses will be conducted to determine whether the model fits differently for African American and European American students.

In addition to changing aspects of the research design, the pilot study has also led to an improvement within the proposed model. According to the model, emotion regulation only exhibits an effect on academic achievement via an interaction with performance-approach goals. However, evidence from the pilot data suggests that emotion regulation strategies have an independent effect on achievement outcomes. As such, the model has been refined to include a direct link between emotion regulation and achievement (see Figure 2). It is hypothesized that emotion regulation strategies are directly associated with achievement outcomes.

Hypotheses

In review, hypothesized relations for the proposed study are reflected in Figure 2. Performance goal elements perceived in the class goal structure will be positively associated with the endorsement of personal performance-approach goals. This relation will be explained by student theories of intelligence. Similarly, performance goal orientations in the home environment will be positively associated with the adoption of personal performance-approach goal orientations. The relationship between performance

goal messages in the home environment and the adoption of a personal performance-approach orientation will be mediated by the theories of intelligence that students possess.

The interaction between performance-approach goals at home and in the classroom should be associated with emotional experiences in math class. Dissonance (e.g. students perceive a strong performance environment in math class and weak performance environment at home) will be associated with either positive emotional responses under a protective hypothesis or negative emotional responses if students perceive these messages as dissonance between the school and home.

Endorsement of performance-approach goals will be positively related to achievement outcomes, in this case, cumulative grades in math and the score on the most recent math unit test. I expect performance-approach orientations to be positively associated with the experience of debilitating emotions. Finally, the use of emotion regulation strategies will be associated with achievement. The association will be positive for emotion regulation strategies such as task-focused processes, cognitive appraisal strategies, and tactics for regaining task focus. The association will be negative for emotion-focused strategies. In addition, when students endorse performance-approach goals and report increased use of task-focusing and appraisal strategies, this combination will be associated with higher levels of achievement. In turn, student endorsement of performance-approach goals will interact with emotion focused processes to result in lower achievement.

DISSERTATION: RESEARCH DESIGN AND METHODS

Overview: Proposed Research

In this dissertation study, I tested the PARE Model (Tyson et. al, in review) in mathematics classrooms within a middle school population of 6th, 7th, and 8th grade students, as this setting was expected to elicit a performance-oriented context as well as a wide array of emotional responses. In particular, I examined how performance-approach oriented contexts can elicit debilitating emotions, which, in turn, activate the need for emotion regulation strategies. Building upon the aforementioned pilot study, I also examined how contextual factors influence the adoption of performance-approach goal orientations and emotional responses in math class.

The current investigation took place during the second and third marking periods of the 2007-2008 school year. During the second marking period (mid December 2007), consent for participation was obtained from students. In January, students were asked to reflect on their experiences within their math classes and respond to questionnaires assessing their personal goal orientations as well as goals perceived in the home and school environment, their theories of intelligence, emotional responses, and strategies for regulating their emotions. For this study, the focus was student motivational perspectives and emotions within their math classrooms and while taking tests that count toward their final math grades. Students completed several questionnaires that addressed different aspects of the PARE Model.

Recruitment, Rationale, & Participant Selection Criteria

Participants were drawn from a southeastern middle school that includes 6th, 7th, and 8th grade students ($n = 1,000$). A total of 328 students and 13 math teachers participated in this study. A critical issue in research design is the ability to estimate the sample size needed to exhibit sufficient power to detect a meaningful effect (MacCallum, Brown, & Sugawara, 1996). In structural equation modeling, the power needed for a study depends on the size of the model, the amount of missing data, the distribution and reliability of the observed variables, and the strength of the relation among variables (Muthén & Muthén, 2002). According to MacCallum et al. (1996), in order to assure a moderate to high level of power of .80, based on $\alpha = .05$, the N for a study should be approximately 300, allowing for at least 30 on the degrees of freedom in this study. When the degrees of freedom and N for a structural equation model are low, power is extremely low (MacCallum et al., 1996). However, as described in the results section, there are multiple proposed tests for this model, depending on the emotion regulation strategy and the type of debilitating emotion assessed.

Participants were recruited in their homeroom classrooms as described below. Data were collected from 328 participants total ($n = 113$ 7th graders, 105 7th graders, and 110 8th graders). In addition, as this middle school population is ethnically diverse, the population consisted of 54% African American, 24% European American, 16% Hispanic, and 6% other. All participants provided written assent and parental consent for their participation. Latino adolescents received a Spanish translation of consent forms that were sent home to parents.

Recruitment for this sample took place during December 2007. Specific strategies were used to enhance the participation in this sample. First, the principle investigator and four research assistants presented the study to students and teachers by entering the homeroom classrooms for five minutes to introduce the study and answer any questions. In this brief overview, researchers stated:

“Good morning! We are researchers at Duke University and we are especially interested in learning how students deal with taking tests in their math classes. We want to know what it is like for you before taking math tests, and what you think and feel during the test. We also want to have some information about the general learning environment in your math classes and at home. We are asking you to help us with our research project by completing some questionnaires about these topics. In addition, we are also going to ask you simple questions about your background. Altogether, these questions will take about 25 minutes and you will receive a \$10 gift card of your choice for participating. These include gift cards for iTunes, Target, Cold Stone, or McDonalds. Before you can participate, the first thing we need you to do is return the following two consent forms. The first is for parent consent, where your parents agree to let you participate in the study. The second is your assent form, where you agree to participate. We will be collecting consent forms from your teachers every week until the study begins. After we have collected all consent forms, we will return to your homerooms and give out the questionnaires. You must return your questionnaires to your homeroom teachers to receive your Gift Card. More details will be provided about the questionnaires once we have received all consent forms. Do you have any questions?”

The study was presented within homeroom classes during their Academic Enrichment periods in order to ensure that all students were invited to participate. In addition, all homeroom teachers assisted in the recruitment process by encouraging student participation and collecting consent forms during this period. For their participation, teachers were compensated with \$10 gift cards as well. Moreover, 10 mathematics teachers for the sixth, seventh, and eighth grade were also asked to complete assessments of the emotion regulation capabilities of each of their students. They were also specifically asked to remind their students about the study as these teachers met with the entire school population, which represented 36 separate mathematics classes. The

math classes included: pre-algebra, algebra, and geometry; each grade level had classes designated by four levels of ability, from lowest to highest.

Procedure

At *Time 1*, students were introduced to the study and the researchers. Research assistants presented the study to each of the 6th, 7th, and 8th grade math classes. At this time, researchers administered consent and assent forms that were sent home to parents. During *Time 2* (approximately three weeks after *Time 1*), students who obtained permission were given Packet 1 to complete during their 30 minute Academic Enrichment Period. This packet assessed the background motivational variables of interest. This assessment included all achievement goal measures, theories of intelligence, and several demographic questions. At *Time 3*, students took a unit test in their math class. This test was taken anywhere from 1-2 weeks after the initial questionnaire. The primary investigator waited until all math classes had a chance to take a math unit test before administering the next set of questionnaires. Three weeks after Packet One was administered, at *Time 4*, students completed Pack Two, which contained questions that asked about their emotional experiences during their last test in math class as well as the strategies they generally employ while taking math tests. Students varied in the time that lapsed between their last math test and the administration of Packet Two. This time ranged from 0 to 20 days, with an average of 7.31 days. Approximately one third of all classrooms completed Packet Two 0-3 days after their last math exam. For their participation, students were compensated with a \$10 gift card to Target, ColdStone, McDonalds, or iTunes. In addition, mathematics teachers completed an assessment of

general student emotion regulation for each of the students in their math class that participated in the study. For their time, teachers were compensated \$40.

Math test scores and overall achievement measures included the final semester grade in math, and grades on student benchmark exams were collected from math teachers in February and March.

Self-Report Instruments

Demographic data. Participants provided basic demographic data that included their age, sex, ethnicity, and class team.

For all measures, students were given explicit instructions to think about their experiences in the mathematics classrooms. First, students reported the name of their math class (pre-algebra, algebra, advanced, etc.) and the name of their teacher. Next, they were instructed to think about their math class while they answered the questions in the packets.

Classroom goal structure. Student perceptions of the classroom goal structures were assessed using an adaptation of the Patterns of Adaptive Learning Survey (PALS, Midgley et al., 2000). This scale is composed of two subscales: classroom mastery structure and classroom performance structure. The five-item classroom performance structure subscale assessed the extent to which students believed that the goals of the classroom were to demonstrate their competence ($\alpha = .87$; e.g., “In our class, it’s important to get high scores on tests”). The six-item classroom mastery structure items assessed the extent to which students perceived the purpose of engaging in academic work in the classroom was to develop their competence ($\alpha = .82$; e.g., “In class, trying hard is very important”).

Home goal orientation. Student perceptions of the goal orientations that their parents emphasized were assessed using an adaptation of the Patterns of Adaptive Learning Survey (PALS, Midgley et al., 2000). This scale is also composed of two subscales: parent performance goals and parent mastery goals. The parent performance goal subscale consisted of five items and assessed the extent to which children believed that their parents wanted them to demonstrate their competence ($\alpha = .75$; e.g., “My parents think getting the right answers in class is very important”). The parent mastery goal subscale consisted of six items and measured the extent to which children believed that their parents wanted them to develop their competence ($\alpha = .71$; e.g., “My parents would like me to do challenging class work, even if I make mistakes”).

Achievement goal orientations. Participant goal orientations were assessed using an adaptation of the Patterns of Adaptive Learning Survey (PALS, Midgley et al., 2000). Six items were used to assess performance-approach goals ($\alpha = .86$; e.g., “I wanted to do my best so that I could do better than other students in my math class.”); seven items were used to assess mastery-approach goals ($\alpha = .83$; e.g., “My goal in math class is to make sure that I learned how to solve the reasoning problems”); six items were used to assess mastery-avoidance goals ($\alpha = .75$; e.g., “My goal was to avoid falling short of my potential in math class”); six items were used to measure performance-avoidance goals ($\alpha = .67$; e.g., “My goal was to avoid looking stupid in math class”). All items were rated on a 5-point Likert scale ranging from 1 (not at all true) to 5 (very true).

Theories of intelligence. Student attributions about intelligence were assessed using the Theories of Intelligence-Child scale (Dweck, 1999; Blackwell et al., 2007). Although prior research has found that the scale, scored such that higher scores reflect the

endorsement an entity theory of intelligence, has demonstrated internal reliability ($\alpha = .71$ in Blackwell et al., 2007), the reliability in this study was quite low for the overall scale $\alpha = .46$. An examination of the items suggested that the scale was comprised of 2 subscales. Among the eight items, five items assessed entity theories ($\alpha = .71$, e.g., “Your intelligence is something about you that you can’t change very much”) and three items that were reverse coded that assessed incremental theories ($\alpha = .75$, e.g., “You can greatly change how intelligent you are”), which were reverse coded. The items on this scale were rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Since the reverse coded items that represent incremental theories dramatically reduce the alpha of this scale, they are excluded from this study. Indeed, the reliability for the scale without those items is $\alpha = .71$, compared to .46 when the items are included. For ease of interpretation, a latent variable for theories of intelligence is labeled as ‘entity theories’ in which higher scores on the measure indicate increased entity theories of intelligence. A further examination of the item suggested that there were two types of entity theory items: ones that represent one’s own perception of intelligence and one’s that represent the theories of intelligence endorse by others in the students environment.

Emotions: Izard Differential Emotion Scale. Participants’ emotions were assessed using Izard’s Differential Emotion Scale (1972). All participants were asked to focus on their emotions while taking their most recent math test and indicate the extent to which they felt particular emotions, ranging from 1 (not at all) to 5 (very true). Although both pleasant and unpleasant emotional experiences were assessed, for the focus of this study we examined the role of debilitating emotions. Thus, four dimensions of potentially debilitating emotions were assessed, which reflect two types of emotion activation:

Activated debilitating emotions:

- (1) Anger subscale ($\alpha = .89$; e.g., annoyed, 12 items),
- (2) Anxiety subscale ($\alpha = .83$; e.g., anxious, 10 items),

Deactivated debilitating emotions:

- (3) Distress subscale ($\alpha = .81$; e.g., discouraged, 5 items),
- (4) Shame subscale ($\alpha = .81$; e.g., ashamed, 6 items), and

When assessing the experience of debilitating emotions, I considered the role of the following subscales: anxiety, anger, distress, shame. In order to create empirically useful and meaningful latent constructs for the indicators of debilitating emotions, we calculated separate models for activated and deactivated emotions. As such, anger and anxiety were included in the same models because these debilitating emotions represent intense and highly activated emotional responses. Similarly, the debilitating emotional responses of shame and distress were included in the same model because they are lower in activation than both anger and anxiety.

Emotion regulation: Schutz's Emotion Regulation during Test-Taking Scale. To examine the specific emotion regulation strategies enacted during test taking, Schutz's Emotion Regulation During Test-Taking Scale (ERT, 2000) was administered. The ERT is a 43-item measure that assessed four dimensions of emotion regulation strategies: cognitive appraising processes, task-focusing processes, regaining task-focusing processes, and emotion-focusing processes. To assess these four dimensions, the scale included eight subscales. Directions for the scale are, "While answering the questions, do not just think about the tests in this class, but think about tests and math test-taking in general". *Goal congruence* was composed of six items ($\alpha = .80$; e.g., "My grades on tests

show how much I have learned”); *agency* was composed of five items ($\alpha = .85$; e.g., “I am responsible for my own test results”); *testing problems efficacy* was composed of four items ($\alpha = .79$; e.g., “I am confident I can deal with unexpected questions on tests”); *task-focusing processes* was composed of five items ($\alpha = .57$; e.g., “I skip questions I am unsure of and come back to them later”); *tension reduction* was composed of four items ($\alpha = .77$; e.g., “I try to clear my head”); *importance reappraisal* consisted of six items ($\alpha = .72$; e.g., “I remind myself that the test is only one part of the class”); *wishful thinking* was composed of five items ($\alpha = .77$; e.g., “I find myself wishing the test was over”); *self-blame* contained four items ($\alpha = .86$, e.g., “I blame myself for the problems that I am having on the test”). All items on this scaled were rated on a 5-point Likert scale ranging from 1 (almost never) to 6 (almost always).

Because the scale for task-focusing processes has low internal reliability ($\alpha = .57$), the inter-item correlations were examined. The item “I try to answer the test question by picturing where it is in my notes or reading materials” was dropped and the alpha for this subscale increased to .70. Indeed, dropping this item was supported by confirmatory factor analysis and personal communication with one of the scale developers (Davis, H., personal communication, March 31, 2008). The subscales of the emotion regulation measure were divided in to two theoretically meaningful types of emotion regulation: Cognitive Appraisal/Task-Focusing Strategies and Emotion-Focused Processes (Schutz & Davis, 2000)

Cognitive Appraising & Task-focusing Strategies. The first three dimensions of emotion regulation strategies (cognitive appraising, task-focusing, and regaining task focus processes) were combined into one latent variable because they relate to each other

and they reflect the underlying constructs of task-appraisal and specific task-focusing attempts. For example, in the Schutz ERT, importance reappraisal is classified as a task-focusing process even though it has elements of appraising the test-taking situation.

Indeed, these items are also highly correlated, as demonstrated in the results section

Emotion focused processing. Similarly, emotion focused processing strategies were combined to form another latent variable. Also the two subscales for this larger latent variable reflect the underlying construct of emotion regulation techniques that are often associated linked to increases in anxiety and anger (Schutz et. al, 2006).

Teacher ratings of student emotion regulation. In addition to assessing emotion regulation with the Schutz (2004) scale, emotion regulation strategies were also measured by teacher reports of broader student attempts of emotion regulation in math class.

Teachers reported on two specific aspects of student emotion regulation in classroom settings: emotion regulation and academic behavioral skills. These scales were obtained from the Children's Social Competence Scale (Gesten, 1976). Ten items were used for the emotion regulation subscale, which assessed a student's ability to manage their emotions in the classroom ($\alpha = .85$; e.g., "This student copes well with failure"). The academic behavioral skills scale included seven items and assessed a student's ability to remain on task ($\alpha = .85$; e.g., "This student pays attention"). Although not explicitly labeled as emotion regulation, the items on this construct reflect similar strategies and tactics that are assessed in the Schutz ERT. Thus, they were retained in this analysis.

ANALYTIC STRATEGY

Structural equation modeling (SEM) was used to analyze the data in the proposed study using Mplus, Version 4.2. SEM was chosen for this study because it poses several advantages in assessing latent variables. Some measures in this study assess the same construct, which can be used to construct a latent variable. For instance, the latent variable for *Cognitive Appraising and Task-Focusing* strategies was measured by three categories of emotion regulation strategies used during test taking. These categories include: cognitive appraising, task-focusing, and strategies for regaining task focus. As such, SEM allowed the latent variable of emotion regulation to be assessed by an index of these three formative indicators. Also, some variables within this study are not only predictors, but also criterion variables. As an example, while affecting performance-approach goal adoption, theories of intelligence are also influenced by the classroom performance goal structure. These effects can be modeled simultaneously in SEM. For these reasons, SEM is superior to ordinary least squares regression analyses. SEM was used to determine whether the contextual influences were associated with goal orientations and emotional responses and whether student goal orientation and emotion regulation were associated with achievement outcomes. Full information maximum likelihood was used so that all participants could be included in the sample.

Data Preparation

All of the data were entered into an Excel spreadsheet twice to ensure coder reliability. After the data were entered twice, data files were compared in order to identify inconsistencies (or potential errors) in data entry. With regard to specific data properties, all reversed variables were recoded. The normality of all indicators was

assessed and only the debilitating emotion variables presented a non-normal distribution. In particular, student reports of feeling angry, ashamed, and distressed demonstrated positive skew. Thus, estimation strategies robust to violations of normality were applied. In particular, log transformations were computed on these variables to improve skew and make the data more symmetrical (Daly & Bourke, 2000). Descriptive statistics of the sample are provided in Tables 1 and 2, including the mean, standard deviation, and range of all variables of interest.

Missing Data

For the self-reported indicators in this study, missing data occurred for at least two known reasons. First, because participants completed two packets for this study, spaced 3 weeks apart, some students are missing information for the second packet. While attempts were made to reach students who did not complete the packet, data for packet two is missing for 15 students. During the course of the grading period, 11 students were absent during the days for data collection, 2 were suspended, and 2 moved to a different school. Other missing data is likely missing at random. In order to compensate for this, full information maximum likelihood (FIML) procedures were used to optimize the sample size and avoid list-wise deletion techniques that are standard in traditional regression analysis.

Estimating the Measurement Model

As SEM is a two-step approach, the first step entailed estimating the measurement models. In this step, confirmatory factor analysis (CFA) was used to examine how indicators loaded on the latent variables of interest. The indicators were expected to load significantly onto their respective factors and are reported in the table of the factor

loadings. All indicators that did not load significantly were dropped from the analyses. This information is provided in tables of the measurement model factor loadings. The measurement models ranged in the number of latent variables, which included: classroom goal orientation, home goal orientation, theories of intelligence, performance-approach orientation, emotional responses (anger, anxiety, shame, and distress), and emotion regulation (appraising and task-focusing strategies, emotion focused processes, or teacher reported student emotion regulation). Separate CFA's were conducted for a total of ten measurement models.

Model Respecification: Alternative and Equivalent Models

If the measurement model did not fit the data, model respecification was guided by theory. In order to compare the baseline model to alternative models, the χ^2 difference test was used when appropriate. In addition to alternative models, it is possible that statistically equivalent models (compared to the baseline model) exist. In order to compare the baseline model to equivalent models, the χ^2 difference test was also used. It is highly likely that equivalent models that estimate different causal pathways may not change the model fit, parameter estimates, or associations between variables. To rule out equivalent models, directionality was established based upon theory for the proposed research design.

Estimating the Structural Paths

The second step in SEM required estimating the structural paths of the proposed models. To test the theoretical model there were six structural regression models, each of which involved a particular category of emotion regulation strategy (all task-focusing and appraising strategies, emotion focused strategies, or teacher reports of emotion

regulation). The emotion regulation strategy types were analyzed in separate models to reduce the complexity of the structural model and because different relations were expected among the strategies. Although this method did not allow us to examine the relation among all emotion regulation strategies, this was not a problem for this study because we were interested in the relationship between particular emotion regulation strategies and the motivational variables. In addition to examining fit for the structural models, mediation and moderation were also tested in each of the six models. I was interested in the mediating role of theories of intelligence. In addition, I was interested in moderating role of the individual emotion regulation strategies.

As SEM is, by definition, a system of simultaneous regressions with the inclusion of measurement error, each of the paths was automatically tested for the following hypotheses as indicated. In the case of mediation or moderation, specific steps for testing either process are outlined below.

In order to test the first hypothesis, the direct relation between school performance goal structures and performance-approach goals was tested to obtain standardized path coefficients. Here, the path coefficients should be significant and positive. To test the second hypothesis regarding the mediating effect of theories of intelligence on the relationship between class performance goal structures and performance-approach goals, the path from school goal structures to performance-approach goals should be significant and positive and, in turn, the path from theories of intelligence to performance-approach goals should also be significant and positive. In order to test for mediation, the traditional model statement in Mplus will be replaced with a “MODEL INDIRECT” command to determine whether theories of intelligence

mediated the relation in the model. This model statement was used to request the calculation of indirect effects and their standard errors. Based on the third hypothesis, the standardized path coefficients from performance goal orientations in the home environment should be significant and positively associated with the adoption of personal performance-approach goal orientations. With regard to the fourth hypothesis, the path between performance goal messages in the home environment and the adoption of a personal performance-approach orientation should be mediated by the theories that students possess regarding their achievement. Considering the fifth hypothesis, difference score between class performance goal structures and performance environments at home should be positively associated with debilitating emotional responses. In particular, the difference score should reflect the extent to which this is dissonance between goals perceived in the home and classroom context. Based on the sixth hypothesis, the path from performance-approach goals to achievement outcomes was hypothesized to be significant and positive. For hypothesis seven, the path between performance-approach orientations and emotional responses, especially with the experience of debilitating emotions, will be significant and positive.

Finally, with regard to the final hypothesis, emotion regulation was hypothesized to moderate the relationship between performance-approach-goals and achievement. Here, moderation was tested by creating a product (interaction) term for performance-approach goals and each of the emotion regulation strategies. First, the SEM model was run with this product term. Second, the model was run without the product term; thus, producing an unstandardized regression coefficient. Next, the product term was run in the model to obtain a z-statistic. Finally, achievement was regressed on the interaction

and if it is significant, then emotion regulation moderated the relation between performance-approach goals and achievement.

Grade Level Analyses. This study incorporates cross-sectional data from 6th, 7th, and 8th grades. After the analysis that considered all students in the model at once, I conducted further tests across all three grade levels. First, I assessed the mean levels of latent variables across grade level. Analyses sought to determine whether there were differences between students who were earlier in the transition to middle school compared to students who have already adjusted to the middle school environment. As such, exploratory analyses were conducted using the “GROUPING” command in Mplus. In order to test model fit across the three grade levels, the factor loadings needed to be the same across these three groups based on a test of invariance. To the extent that these loadings were different, this indicated that the models may not fit equally across grade levels. Finally, I explored grade level as a moderator, particularly for the ratings of performance goals across contexts and for the experience of debilitating emotions.

Ethnicity Analyses. In addition, I ran ethnic comparisons to assess the relation between goal orientations and achievement for African Americans compared to Euro-Americans. First, mean levels for the latent variables were assessed by ethnicity. Analyses were conducted for the African American and European American students. Again, the “GROUPING” command was used to compare model fit for the African American and European American sub-samples. As stated previously, the factor loadings needed to be the same across these two groups based on a test of invariance. The extent that these loadings were different was indicative that the models may not fit equally across ethnic groups. If there were differences with model fit across groups, I explored

the relations between the latent variables and responses to the ethnic identity measure to more fully examine potential ethnic differences and their sources.

Method of Estimation

As full information maximum likelihood (FIML) is the standard method of estimating free parameters in structural equation models; it was employed in this analysis. Maximum likelihood is an optimization criterion that specifies that estimates are obtained given the greatest probability given the observed data. Additionally, maximum likelihood is the ideal choice compared with other estimators because it performs well with smaller sample sizes.

Fit Criteria. The overall fit of the models was evaluated with χ^2 as the goodness of fit test as a starting point. If the χ^2 was not significant, then the model had good fit. Because χ^2 statistics are influenced by sample size, I also used fit indices that are less sensitive to sample size. As such, the Tucker-Lewis index (*TLI*) was used because it performs consistently under maximum likelihood estimation. In addition, the *TLI* is less variable with smaller sample sizes compared to alternative type-2 fit indices. Moreover, the Comparative Fit Index (*CFI*) and *RMSEA* (root mean square error of approximation) were used to evaluate overall fit. Whereas the central χ^2 distribution is only based on degrees of freedom, the noncentral χ^2 distribution on which *CFI* and *RMSEA* are based accounts for the fact that there is mis-specification in the model and a model will never fit perfectly. For the *CFI*, .90 and above reflects a good fitting model. The *RMSEA* is interpreted as a measure of absolute fit in which smaller numbers are better. *RMSEA* uses the notion of close fit. If the point of estimate is $\leq .05$, there is close fit; if it is $\leq .08$, there is acceptable or reasonable fit; $\geq .10$, the fit is unacceptable or poor fit.

RESULTS

Measurement Model

The analyses were conducted using two steps. The first step entailed estimating the measurement model where loadings for the motivation and emotion constructs were derived. Here, confirmatory factor analysis (CFA) was used to examine how latent variables loaded on the measured variables. Only those indicators that loaded significantly onto their respective factors are reported. All indicators that did not load significantly were dropped from these analyses. Acceptable factor loadings for indicators (loadings > .40) were retained in the analyses (Kline, 1998). All information for standardized factor loadings is provided in a table of the measurement model factor loadings (see Tables 3 through 8). The measurement model includes latent variables for: the class performance goal orientations, home performance goal orientation, entity theories of intelligence, personal performance-approach orientation, debilitating emotions, and emotion regulation.

Measurement Model: Motivational Variables

Classroom Performance Orientation. The Confirmatory Factor Analysis (CFA) for classroom performance goal orientation confirmed that, indeed, the latent variable for classroom performance orientation was composed of five variables (see Table 3). All of the original indicators were retained in this analysis, and the fit of the measurement model with all five indicators was adequate ($CFI = .99$, $TLI = .98$, $RMSEA = .07$, $\chi^2(5) = 13.10$, $p < .02$). In addition, adding correlations between indicators, as suggested by the modification indices, increased factor loadings.

Home Performance Goals. The latent construct for performance goals fostered within the home environment originally consisted of five indicators. The CFA suggested that all of the indicators should not be retained for the analysis. The indicator, “My parents would like me to show others I’m good at my class work” presented lower loadings than the other indicators (.38), and the fit of the model was unacceptable ($CFI = .95$, $TLI = .89$, $RMSEA = .12$, $\chi^2(5) = 25.65$). Thus, this indicator was dropped from the analysis. Final factor loadings are presented in Table 3 ($CFI = .98$, $TLI = .95$, $RMSEA = .08$, $\chi^2(2) = 7.06$, $p < .03$).

Performance-Approach Goals. The latent variable for personal performance-approach goals was initially composed of six indicators. The first indicator, which assessed the importance of having the other students believe the student was good at class work, exhibited a low factor loading and the fit of the measurement model according to the $RMSEA$. The factor loading was considerably lower than the other factors (.35) and, therefore, deemed unacceptable ($CFI = .94$, $TLI = .89$, $RMSEA = .14$, $\chi^2(6) = 42.03$, $p < .0001$). The item was dropped from the model and the latent variable was re-assessed. The construct was considered valid with the elimination of this item and model fit was, then, adequate (see Table 3, $CFI = .99$, $TLI = .93$, $RMSEA = .06$, $\chi^2(4) = 23.81$, $p < .0001$).

Theories of Intelligence. Although this scale originally consisted of eight items, the factor loadings were inconsistent for several indicators, as suggested in the method section. After removing the reverse coded items, as mentioned in the method section, there still seemed to be multiple factors represented in this scale. Further, adding the correlations between indicators did not improve the factor loadings. Therefore, I

explored the option of creating a sub-factor that represented the underlying construct of an ‘entity theory environment’. Indeed, two distinct factors emerged when the items were examined for face validity: entity theories possessed by the individual and entity theories possessed by others. The resulting sub-factors were checked for their face validity and considered valid. The latent construct of entity theory environment loaded significantly on each of the sub-factors at .65 and .55 and the entire model fit well. Final loadings are presented in Table 4 ($CFI = .99$, $TLI = .98$, $RMSEA = .05$, $\chi^2(6) = 14.62$, $p < .0003$).

Measurement Model: Emotion Variables

Anger. The original construct of anger (from the Anger-Disgust-Contempt Subscale) initially consisted of 12 items. However, when all items were included in the model, the factor loadings were inconsistent and model fit in the measurement model was poor (even when indicators were allowed to correlate with one another). Based on the factor loadings, nine of the twelve indicators of anger were retained in this analysis: irritated, angry, mad, bitter, annoyed, defiant, and rebellious. Other items had factor loadings less than .40. All factor loadings are presented in Table 5, and the fit of the measurement model was adequate ($CFI = .99$, $TLI = .98$, $RMSEA = .05$, $\chi^2(22) = 39.35$, $p < .01$).

Anxiety. The latent variable for anxiety (from the Fear-Terror Subscale) originally consisted of 9 items, according to the Izard Differential Emotion Scale. Factor loadings were consistent when all items were included in the model. The construct was examined for face validity and deemed valid. Although the loadings for anxiety were lower than all other indicators (.44), the decision was made to retain this indicator in the

analysis because it still met the baseline criteria and presented a normal distribution in the data. All factor loadings are presented in Table 5 and the fit of the measurement model was adequate ($CFI = .98$, $TLI = .97$, $RMSEA = .05$, $\chi^2(27) = 51.75$, $p < .003$).

Distress. Feeling distressed (from the Distress-Anguish Subscale) was assessed using five indicators: sad, downhearted, discouraged, upset, and distressed. As all of these items provided acceptable factor loadings, all five indicators were used to create the latent construct of distress. The distress factor loadings are presented in Table 5, and the fit of the measurement model was adequate ($CFI = .99$, $TLI = .98$, $RMSEA = .06$, $\chi^2(5) = 11.77$, $p < .04$).

Shame. Feelings of shame (from the Shame-Guilt Subscale) initially consisted of six items: ashamed, guilty, blameworthy, repentant, inadequate, and embarrassed. When all items were included in the measurement model, they presented loadings above the established cutoff. Thus, all six indicators of shame were included in the analysis. Factor loadings for shame are presented in Table 5, and the fit of the measurement model was adequate ($CFI = .98$, $TLI = .97$, $RMSEA = .07$, $\chi^2(8) = 20.18$, $p < .01$).

As previously stated, emotions grouped together in the models represent the distinction between highly activated emotional responses (anger and anxiety, see Figures 3, 7, and 10) and emotional responses of low activation (shame and distress, see Figures 8, 9, and 11). In empirical defense of these distinctions, a model that included all of these emotional experiences at once was calculated and it failed to converge, even after several attempts to re-specify the level of convergence.

Measurement Model: Emotion Regulation Strategies during Test-Taking

The overall measurement model for the Schutz Emotion Regulation during Test-taking scale, including 4 factors, fit the data adequately ($CFI = .96$, $TLI = .96$, $RMSEA = .03$, $\chi^2(499) = 718.55$, $p < .0001$). All loadings are presented in Table 6. As previously mentioned in the methods section, cognitive appraising, task-focusing, and regaining taking-focusing processes were combined to form one latent variable, ‘Cognitive Appraising and Task-Focusing Processes.’ In addition, ‘Emotion-Focused Processes’ composed the second latent variable that assessed emotion regulation strategies used during test-taking.

Cognitive Appraising Processes. The latent variable for cognitive appraisal processes consisted of the three sub-factors that emerge in the Schutz Emotion Regulation during Test-Taking Scale (2004). The first sub-factor, *goal congruence*, consisted of four indicators. Each of the indicators presented consistent loadings. The second sub-factor, *agency*, also consisted of four indicators and presented consistent loadings. Finally, the third sub-factor, *testing problems efficacy*, was assessed using four indicators. Similar to the first two sub-factors, these indicators all presented consistent loadings. In turn, each sub-factor loaded significantly onto the first-order latent variable of cognitive appraising processes. Final loadings are presented in Table 6.

Task-focusing Processes. The latent variable for task-focusing processes initially consisted of six indicators. The CFA indicated that the final indicator, picturing where the answer was in one’s notes, loaded poorly with the other indicators. Therefore, this indicator was dropped from further analysis and the construct was checked for face

validity. Indeed, the items were valid and five indicators of task-focusing processes were retained in the model.

Regaining Task-focusing Processes. The latent variable for regaining task-focusing processes was comprised of two sub-factors. *Importance reappraisal* initially contained four indicators. Although the CFA showed adequate fit for the four indicators, the loadings for one of the indicators, keeping test importance in perspective, was lower than the other indicators and, therefore, deemed unacceptable (.30 vs. .74, .50, & .71). This factor loading could not be improved through modification indices and allowing the indicators to correlate. As such, the item was dropped from subsequent analyses. The second sub-factor, *tension reduction*, contained four indicators in the original scale. These indicators were allowed to correlate and showed consistent loadings, as shown in Table 6.

Emotion Focused Processes. The latent variable for emotion focused processes contained two distinct sub-factors: wishful thinking and self-blame. Wishful thinking consisted of four indicators. The factor loadings were, indeed, consistent with one another, as prescribed in the original scale and so all indicators were retained for the analysis. With regard to self-blame, there were also four indicators of the construct: Similar to wishful thinking, these items presented consistent factor loadings and all items were retained for the analysis.

Measurement Model: Teacher Rating of Emotion Regulation

Teacher ratings of emotion regulation were initially composed of 16 variables from two subscales. The first subscale, general strategies, consisted of ten items. The second subscale, academic regulation skills, consisted of six items. Adding correlations

between indicators, as suggested by the modification indices, increased factor loadings and, then, indicators that maintained poor factor loadings were dropped. From subscale one, the following items were dropped: accepting things not going his/her way, waiting in line, and playing by the rules of the game. The remaining seven items were deemed face valid and, thus, retained in the analysis. With regard to the second subscale, two items were dropped: working well without adults and following teacher directions. In total, the CFA identified twelve indicators that represented the emotion regulation construct, according to teacher report. Final loadings for the model are located in Table 7 ($CFI = .99$, $TLI = .99$, $RMSEA = .05$, $\chi^2(40) = 73.41$, $p < .001$).

The scales reporting teacher reports of emotion regulation did not load significantly with the student report of emotion regulation during test-taking strategies and, thus, were entered into a separate model. Whereas this scale measures teacher reports of a student's broader ability to regulate emotions (i.e., ability to cope with failure, calm down when upset, think before acting), Schutz's ERT assesses specific strategies enacted during tests. Therefore, it was not surprising that these constructs did not load together. Further, when attempts were made to combine both general reports of emotion regulation and student reported strategies into the same model, the model failed to converge. Thus, teacher reports and student reports of emotion regulation were considered separately in the analyses.

Grade Level Analyses

Measurement invariance ensures that the constructs measured are comparable across grade level and ethnicity (Widaman & Reise, 1997). Items were retained in the model if they met the reliability criteria (loadings $> .40$), group invariance (items work

similarly across grade levels and ethnic groups), and adequate predictability (Moore et al., 2002; Nelson et al., 2006).

The fit of the measurement model was compared with regard to the individual difference factors that were hypothesized to be potential moderators of the relations in the model. With regard to grade level, there was no support for differences in reports of goal orientation or debilitating emotional experiences. The unconstrained CFA model for the goal orientation and theories of intelligence indicators was satisfactory ($\chi^2 (125) = 150.43, p = .001, CFI = .98, TLI = .97, \text{ and } RMSEA = .03$). With all of the factor loadings constrained across grade level, the model fit was still satisfactory ($\chi^2 (117) = 140.51, p = .001, CFI = .96, TLI = .95, \text{ and } RMSEA = .05$) and the χ^2 difference was not significant ($\Delta\chi^2 = 9.92, df = 8, p = .27$), which indicated measurement invariance for grade level differences in the motivational constructs. Indeed, factor loadings for the goal orientation and theories of intelligence items were similar across grade level.

Debilitating emotions were also considered for grade level differences in the measurement model. The CFA that accounted for grade level differences in reports of debilitating emotions was inadequate ($\chi^2 (378) = 611.99, p = .001, CFI = .87, TLI = .85, \text{ and } RMSEA = .09$). However, when all of the factor loadings were constrained across grade level, the model fit was adequate ($\chi^2 (352) = 599.82, p = .001, CFI = .95, TLI = .94, \text{ and } RMSEA = .05$) and the χ^2 difference was not significant ($\Delta\chi^2 = 12.17, df = 26, p = .98$), indicating that the measurement model fit equally for debilitating emotions across grade levels.

Measurement Model: Ethnic Differences

Ethnic differences were examined in the data with regard to both student reports of the motivational variables and reports of debilitating emotions, in accordance with the hypotheses. Similar to the analyses by grade level, there was no indication of differences in reports of student goal orientations or theories of intelligence. The fit of the unconstrained model, which examined ethnic differences, was adequate ($\chi^2 (125) = 141.38, p = .001, CFI = .98, TLI = .97, RMSEA = .03$). The constrained model, allowing for invariance across factors, also presented adequate fit ($\chi^2 (117) = 140.51, p = .001, CFI = .96, TLI = .95, RMSEA = .05$) and the χ^2 difference was not significant ($\Delta\chi^2 = 0.87, df = 8, p = .99$), indicating that the measurement model for debilitating emotions did not differ across ethnic groups.

In line with previous tests, there were no significant ethnic differences in reports of debilitating emotional experiences. Considering the fit of the unconstrained model, which examined ethnic differences in debilitating emotions, model fit was satisfactory ($\chi^2 (333) = 503.09, p = .0001, CFI = .91, TLI = .90, RMSEA = .07$). The constrained model, allowing for invariance across factors, also presented adequate fit ($\chi^2 (324) = 504.59, p = .0001, CFI = .95, TLI = .94, RMSEA = .05$) and the χ^2 difference was not significant ($\Delta\chi^2 = 1.50, df = 9, p < .0001$), failing to indicate measurement invariance of debilitating emotions for African-American students compared to Euro-American students.

Structural Models

After measurement models were established for each latent construct, I examined correlations (see Table 8) in order to determine the appropriate models for testing the hypotheses of the PARE Model. In order to test the theoretical model, the structural

models were comprised of distinct emotions and emotion regulation items. First, the structural models were split to consider both activated debilitating emotions in the same model (anger and anxiety) and deactivated debilitating emotions (shame and distress). Second, structural models were divided to consider the relation of goal orientations, motivation, and emotions as they influence emotion regulation strategies for tests and general teacher reports of emotion regulation in math class. These constructs are not only distinct, but proposed to relate to different outcomes. For example, whereas it is expected that reports of emotion regulation test-taking strategies will be associated with the math test grade, it is likely the case that teacher reports of emotion regulation will be associated with final grades. Finally, math test grade and final math grade were included in different structural models because patterns of findings are different when considering math test grades and final grades, and the distinctions deserve further consideration and discussion. Fit indices for the structural models are presented in Table 9.

Test-taking Strategies, Activated Debilitating Emotions, & Test Grade. For the model predicting test grade in math from the achievement goal orientation and motivation background variables, reports of anxiety and anger, and emotion regulation strategies during test taking, the fit of the structural model was adequate: $CFI = .96$, $TLI = .96$, $RMSEA = .03$, $\chi^2(2000) = 2436.32$, $p < .0001$. All significant model paths are shown in Figure 3, which shows standardized path coefficients.

As stated in the hypotheses, classroom performance goal environments were positively associated with the endorsement of personal performance-approach goals. However, contrary to the hypothesized PARE model, the relation between classroom performance goals and personal performance goals was not mediated by theories of

intelligence ($z = .26$, ns). In fact, evidence of theories of intelligence as a mediator of the relation between performance-approach goals and classroom performance goal structures was absent in all models. In line with these findings, performance goal environments at home were also positively associated with the endorsement of performance-approach goals. Again, there was no evidence that this relation was mediated by theories of intelligence ($z = .58$, ns). Moreover, there the difference score between performance goals perceived in the home environment and in the classroom was not associated with debilitating emotional responses.

Moving to the center of the model, an entity theory of intelligence was only marginally, positively associated with personal performance-approach goals. In addition, the relation between performance-approach goal orientations and math test scores was not significant in this model. Surprisingly, performance-approach goal orientations were not significantly related to the experience of anger or anxiety; however, there was a trend for a negative association, contrary to the hypothesis. Interestingly, anxiety was positively associated with the use of task-focusing and appraisal strategies as well emotion focused strategy use, whereas anger was only positively associated with the use of emotion focused strategies. These strategies were associated with math test grade in the predicted manner; task-focusing and appraisal strategies were positively associated with the test grade and emotion-focused processing demonstrated a negative association with test grades. Finally, the interaction between performance-approach goal orientations and emotion regulation strategies was significant, specifically for self-blame ($z = 2.57$, $p < .001$) and importance reappraisal ($z = -2.053$, $p < .02$). There was also a three-way

interaction involving performance-approach goals, anxiety, and wishful thinking ($z = 3.30, p < .05$).

As shown in Figure 4, when considering the use of emotion-focused tactics such as engaging in self-blame, these particular strategies moderated the relation between performance-approach goals and achievement. As seen in Figure 4, low levels of self-blame are associated with equal levels of achievement on the math test when performance-approach endorsement is low and high. However, high levels of self-blame are associated with decreased achievement on the math test, particularly when students report high endorsement of performance-approach goals.

In a similar pattern to the findings for self-blame, Figure 5 depicts the interaction between performance-approach goals and the use of importance reappraisal during the math exam. Thus, students who thought about the importance of the current exam during the exam were less likely to do well compared to when they held a stronger endorsement of performance-approach goals.

In addition to the two-way interactions found between performance-approach goals and emotion regulation strategies, there is also evidence of a three-way interaction that tests the core of the PARE model: the interaction among performance-approach goals, debilitating emotions, and emotion regulation strategies. Figure 6 demonstrates the significant three way interaction between performance-approach goals, anxiety, and reliance on useful thinking during an exam. According the results, regardless of level of performance-approach goal endorsement, when students reported lower anxiety and wishful thinking they performed better on the math exam. Second, in the case where students reported low experiences of anxiety and high use of wishful thinking, the

students who reported lower performance-approach goals performed better than students with higher endorsement of the same goals. Third, when student reports of anxiety were high and self-reported wishful thinking was low, students who reported lower performance-approach goals performed better than students with higher performance-approach goals. Finally, when reports of both anxiety and wishful thinking were high, students who reported higher performance-approach goals performed better than peers with lower reports of these goals.

Test-taking Strategies, Activated Debilitating Emotions, & Final Grade. The model predicting final math grade from the use of test-taking strategies, anger, and anxiety presented a similar pattern of findings as the previous model. The fit of the structural model was adequate: $CFI = .94$, $TLI = .93$, $RMSEA = .03$, $\chi^2(1981) = 2651.28$, $p < .0001$. All significant model paths are shown in Figure 7, which shows the standardized path coefficients. The relations on the left side of the model are consistent with the previous model and will not be discussed. However, the right portion of the model did present some unique findings, specifically in relation with the achievement outcome. When final math grade was used as the outcome measure, the latent variable for task-focusing and cognitive appraisal strategies showed a stronger positive association to final grade than test grade. In addition, this model demonstrated a negative association between performance-approach goals and final math grade. This negative relation between performance-approach goals and math grade appears in each of the models that considers final math grade as an outcome. There was no evidence that any emotion regulation strategies moderated the relation between performance-approach goals and final math grade

Test-taking Strategies, Deactivated Debilitating Emotions, & Test Grade. The next two models consider the role of deactivated emotional experiences (shame and distress) and their relation to math test grade and final grades, respectively. For the model predicting test grade in math, the fit of the structural model was adequate: $CFI = .96$, $TLI = .95$, $RMSEA = .03$, $\chi^2(1708) = 2144.36$, $p < .0001$. All significant model paths are shown in Figure 8.

Again, relations on the left side of the model were consistent with both previous models. Several unique findings did emerge at the middle of the model. In particular, shame was negatively associated with personal performance-approach goals, contrary to the hypothesis. In addition, shame and distress were both unrelated to the use of task-focused and cognitive appraisal strategies. They were both associated with emotion focused strategy use. Along with this finding, emotion focused strategy use was more strongly associated with math test grade with the inclusion of shame and distress in the model. A final noteworthy aspect of this particular model is the fact that the relations among the motivation variables were strengthened, such that endorsing an entity theory of intelligence was more strongly associated with both classroom and home performance goal ratings with the inclusion of shame and distress. Also, the relation between performance-approach goals and entity theories of intelligence was significant here.

Test-taking Strategies, Deactivated Emotions, & Final Math Grade. In the model predicting final math grade from the experience of shame and distress in conjunction with emotion regulation strategies, the fit of the structural model was adequate: $CFI = .96$, $TLI = .95$, $RMSEA = .03$, $\chi^2(1708) = 2150.39$, $p < .0001$. All significant model paths are shown in Figure 9, which shows standardized path coefficients.

As in previous models, both shame and distress are positively associated with endorsing an entity theory of intelligence. In addition, these emotions are only associated with the use of emotion-focused strategies during a test.

Teacher-Rated Emotion Regulation, Activated Emotions, & Final Grade. In the final two models, the role of teacher rated emotion regulation was explored in conjunction with the motivational variables of interest to determine the overall association with final grades in math class. The decision was made to use teacher reports of student emotion regulation when assessing associations with final math grade because these broader strategies should relate to overall student performance, rather than grades on a single exam. In addition, whereas the student reports of emotion regulation strategies used during tests rely on retrospective accounts of strategies after the test, this measure was assessed before final grades were obtained. For the model predicting final grade in math from the motivation background variables, reports of external debilitating emotions, and the appraisal and task-focusing emotion regulation strategies, the fit of the structural model was adequate: $CFI = .97$, $TLI = .97$, $RMSEA = .03$, $\chi^2(971) = 1308.77$, $p < .0001$. All significant model paths are shown in Figure 10.

As hypothesized and demonstrated in the previous models, motivational variables were positively associated and demonstrated strong relations. The exception was the link between entity theories of intelligence and personal performance-approach goals, which were unrelated in the majority of the models presented. Interestingly, teacher reports of emotion regulation exhibited by each student were negatively associated with anger. Therefore, as teachers rated their students as more successful at regulating emotions in the classroom, students were less likely to report feeling angry on their most recent

mathematics test. Despite this link, anxiety was unrelated to teacher reports of emotion regulation. In addition, teacher reports were positively associated with final math grade. Finally, in contrast to the previous models in which there was an interaction between strategy use and performance-approach goals, there were no significant interactions between teacher reports of student emotion regulation and performance-approach goal orientations ($z = -0.68$, ns).

Teacher-Rated Emotion Regulation, Deactivated Emotions, & Final Grade. For the final model predicting final grade in math from teacher reported emotion regulation and the experience of shame and distress, the fit of the structural model was adequate: $CFI = .97$, $TLI = .97$, $RMSEA = .04$, $\chi^2(827) = 1157.05$, $p < .0001$. All significant model paths are shown in Figure 11, which shows the standardized path coefficients. In general, patterns were very similar to the previous model. Unique to this model, teacher reports of student emotion regulation were only related to decreases in reports of feeling distressed during the last student exam. In turn, teacher ratings of emotion regulation strategies were positively associated with grades. The interaction between teacher ratings and performance-approach goals was, however, non-significant ($z = -1.13$, ns).

Grade Level & Ethnicity as Potential Moderators

In order to test ethnic differences between African-American and Euro-American students in this study, structural models were run comparing the fit of each parameter across groups. The models that could be tested for ethnic differences were limited due to the size of the model that included emotion regulation strategies during test taking and the size of the samples being compared. For example, ethnic differences could not be tested across the first four structural models as these models failed to convergence due to

the comparatively smaller number of Euro-Americans (n=89) in comparison to African-American students (n=152).

Despite these limitations, these two groups could be compared in the models that assess the role of teacher rated emotion regulation (not student reported emotion regulation), which had fewer estimated parameters than the other models. Interestingly, the parameters were not significantly different across grade level ($\Delta\chi^2 = .32, df = 1, p = .59$) or ethnicity ($\Delta\chi^2 = .22, df = 3, p = .97$) in the structural model. This indicates that the model is generalizable across 6th, 7th, and 8th grades in this middle school population.

DISCUSSION

This study has provided preliminary evidence concerning the complex relations among performance-approach goals, emotions, emotion regulation, and achievement in math. There are three predominant findings that are consistent across all models: 1.) performance environments both in the classroom context and home environment shape performance-approach orientations of middle school students and, further, the home and school contexts are significantly correlated; 2.) performance-approach goals were not consistently associated with debilitating emotions, although the endorsement of performance goals was related to experiencing shame in the model with test scores; and 3.) emotion regulation strategies used during test-taking moderated the relation between performance-approach goals and math test achievement . The hypotheses with regard to age and ethnic differences were not upheld in this study, suggesting that the theoretical model that identifies correlates among home and school contexts that shape performance goal orientation and its relation with emotional experiences and achievement outcomes is generalizable across age and ethnicity.

Home and School Performance Orientation, Entity Theories of Intelligence and their Association with Students' Own Orientation

All models provide consistent evidence that performance-approach goals are influenced by both the performance goal structure in the classroom and at home. Across all models, performance-approach goals were related to the performance goal structure perceived in the classroom. This finding suggests that performance-approach goals may be shaped by the goals at the classroom level. Similarly, performance goal structures at home are related personal performance-approach goals. It is interesting that the

performance-approach goals present a somewhat stronger relation with classroom performance goals than they do with performance goals perceived at home ($\beta = .40$ vs. $.22$), suggesting that the goals in the classroom environment have a stronger influence on student's development of personal goals.

It is quite conceivable that the goal items at the classroom and personal level both reflect elements of classroom competition to a larger extent than the items for the home goal structure. Indeed, when parents emphasize a performance environment, they may not be as concerned with peer competition as they are with their children obtaining the correct answers and demonstrating that they are capable of doing class work. In the classroom context, students have immediate reinforcement about their relative progress vis-à-vis their peers and this may have a stronger impact on the competitive aspects of their personal performance-approach goals. Whereas the relative importance of competition and relative ability as indicators of performance-approach goals has been debated (Grant & Dweck, 2003; Urdan & Mestas, 2006), this study provides evidence that the competitive elements of performance-approach goals are indeed prevalent among a middle school population. The relative emphasis on competition and social comparison when demonstrating ability is consistent with salient developmental tasks of early adolescence (Hill et. al, 2007). Indeed, as early research on the competitive aspects of achievement goals has indicated, students in middle school begin to judge their ability relative to their peers (Nicholls, 1984). In addition, contextual clues about social comparison are critical for middle school students (Ruble et. al, 1994).

In addition to relations among students' endorsement of performance-approach goals, the classroom context, and the home environment, there is evidence that

performance goals are related to entity theories of intelligence. Specifically, the endorsement of entity theories of intelligence was associated with both classroom performance goals and performance goals in the home environment. This finding suggests that a student's tendency to view his or her intelligence as a fixed trait is associated with messages about performance goals in both the classroom and home environment. This is consistent with prior research stating that communication and praise regarding theories of intelligence is associated with performance goals (Grant & Dweck, 2003; Mueller & Dweck, 1998). Interestingly, the endorsement of an entity view of intelligence that students perceive others in their environment to hold shows the strongest relation with classroom and home performance goal environments, suggesting that these "others" are indeed family members and school personnel. Collectively, these findings suggest that an emphasis on proving one's ability at home and in the classroom are associated with a student's perception that others believe intelligence to be fixed.

Contrary to prior research and theory (Good, Aronson, & Inzlicht, 2003; Grant & Dweck, 2003; Mueller & Dweck, 1998), entity theories of intelligence failed to show stable relations with a student's personal performance-approach goals across the models, indicating that although other's perspectives on intelligence as fixed does not directly translate into student adoption of a goal orientation that emphasizes the demonstration of ability. Although contrary to the literature on theories of intelligence, this finding indicates that holding a performance-approach orientation is not necessarily influenced by a student's view that their own intelligence is fixed. Though this study did not find cross-sectional differences with regard to endorsement of entity theories of intelligence, it would be interesting to examine the trajectory of the relation between theories of

intelligence and a performance-approach orientation to determine if a student's performance-approach goals are shaped by entity theories over time. Indeed, the lack of the association between entity theories and performance-approach goals in this study suggests that middle school is still a period in which entity views of intelligence may not have fully shaped personal goal orientations. This provides further evidence that the interventions that aim to change theories of intelligence in middle school are well placed to influence academic self-concept, identity, and ultimately achievement (Blackwell et. al; 2007; Good et. al, 2003).

Performance Orientation, Emotional Experiences, Regulation, and Achievement

The second prominent finding in this study is the general lack of a positive association between performance-approach goals and debilitating emotions. Performance-approach goals failed to show a consistent link to debilitating emotions, although they have been related to debilitating and unpleasant emotions in prior work (see Linnenbrink & Pintrich, 2002 for a review). Indeed, there were trends for a negative relation between performance-approach goals and activated debilitating emotions in some the theoretical models. Whereas students reported low levels of all emotions overall, debilitating emotions were significantly related to other latent constructs, including entity theories of intelligence and emotion regulation strategies. These findings suggest that performance-approach goals may not influence the experience of debilitating emotions. Thus, a student's goal of demonstrating competence in math class (i.e., performance orientation) may not be consistently related to feelings of anxiety, anger, shame, or distress in a challenging academic situation. If a student intends to demonstrate his or her competence in math class, this goal could show a negative association with shame and

distress, particularly if the student is meeting that goal. This indicates that performance-approach goals may not inherently possess a link to debilitating emotional experiences. Rather, the findings indicate the experience of debilitating emotions may impact students differentially, as described later.

Consistent with the major tenets of the PARE model, emotion regulation strategies moderated the relation between performance-approach goals and achievement, particularly self-blame, importance-reappraisal, and wishful thinking. In examination of the two-way interactions for performance-approach goals and emotion regulation, the results demonstrate that the use of both self-blame and importance-reappraisal as strategies during the exam are harmful when students endorse performance-approach goals. Understandably, engaging in self-blame during a test-taking situation, which involves criticizing one self for poor test performance and a lack of preparation is negatively associated with achievement. In this study, coupling self-blame and a performance-approach orientation are particularly harmful, as they are associated with decreased test scores. Similarly, in the pilot study, self-blame explained the relation between performance-approach goals and test-performance. Whereas there was no evidence of mediation in this particular study, the results do suggest that self-blame exacerbates the negative association between performance-approach goals and math test achievement.

In addition to self-blame posing a threat to test scores when students endorse high levels of performance-approach goals, there is also evidence that deemphasizing the importance of the test as a strategy during test-taking is dampened student math test performance. In a similar manner as self-blame, reappraising and evaluating the

importance of a test is associated with decreased achievement when students are focused on proving their ability. It is conceivable that when students strive to prove their academic competence, engaging in thoughts that focus on the importance of the test can ultimately interfere with student performance. Although this strategy is referred to as an attempt to 'regain task-focus,' when students are focused on performance-approach goals, this appraisal process can be harmful. Indeed, the findings do not suggest that importance-reappraisal is detrimental when students are less likely to endorse performance-approach goals.

Moreover, the best test of the PARE model is the three way interactions among the endorsement of performance-approach goals, debilitating emotional reactions, and emotion regulation as they relate to math test scores/grades. That is, performance-approach goals are linked to debilitating emotions, which in turn activate the need for emotion regulation, which ultimately influences achievement. Although there is no evidence for the strategies purported to enhance test performance (i.e. task-focusing processes, tension reduction attempts), the results provide some insight into the role of less adaptive emotion regulation strategies. First, the three-way interaction among performance-approach goals, anxiety, and wishful thinking describes the instances in which adherence to performance-approach goals is linked with decrements in achievement. The results indicate that both low anxiety and low levels of wishful thinking are ideal in a test situation, and associated with higher test scores. However, the negative association between performance-approach goals and achievement was evident among students who endorsed performance-approach goals and experienced high anxiety and/or relied on wishful thinking as a strategy. First, students who experienced low

anxiety and relied on wishful thinking during the exam had decreased achievement when they endorsed performance-approach goals. Similarly, those students who experienced high levels of anxiety but did not rely on wishful thinking also had decreased achievement. Performance-approach students who experienced both high levels of anxiety and high levels of wishful thinking had improved achievement, yet this did not reach the level of achievement experienced by students who did not experience anxiety or utilize wishful thinking. Overall, these results indicate that when students are less likely to experience anxiety and rely on wishful thinking, they outperform all other groups. The main and most significant findings indicate partial support of the PARE model, especially support for emotion regulation as a moderator of the relation between performance-approach goals and math achievement. Prior work has examined the association between performance-approach goals and achievement (Linnenbrink & Pintrich, 2002; Pekrun et. al, 2006) yet no studies have examined emotion regulation as a potential moderator.

Further Evidence of Underlying Processes

There are other significant findings that further illuminate the underlying processes and associations among the variables in the theoretical models. In addition to the main findings and hypotheses in this study, there were other consistent findings across the theoretical models. Although a recent review demonstrated that 40% of the studies that showed an association between performance-approach goals and achievement found a positive association while only 5% found a negative association (Linnenbrink-Garcia et. al, 2008), this study found a negative relation between performance-approach goals and final math grade. Interestingly, performance-approach goals were not significantly related to math test grade, though there was a trend for a negative relation.

Though it is difficult to ascertain the reason for the negative relation found in this study, it may be the case that students who endorsed performance-approach goals and engaged in self-blame, wishful thinking, or importance reappraisal were more likely to experienced hampered achievement.

As hypothesized by the literature on dissonance and concordance between home and class performance goals (Arunkumar et. al, 1997; Gutman, 2002), there was no evidence dissonance between home and class performance goal structures. These goals were highly correlated, as shown in Table 3. The lack of association between the dissonance perceived at home and school and the experience of debilitating emotional responses during the prior math exam may indicate that middle school students are able to manage the messages about goal orientations that are provided by the home and school context. Alternatively, the high correlation between classroom goal structures and home goal environments may indicate that there is little dissonance to contend with, as home and school environments both endorse elements of performance goal structures.

Teacher reports of student emotion regulation attempts in math class also demonstrated consistent positive associations with student achievement. Though teacher reports did not interact with performance-approach goals or the experience of debilitating emotions, they were positively associated with both student final math grade and grade on the most recent math exam.

Ethnic Similarities in the Underlying Processes of the PARE Model

Although ethnicity did not moderate the hypothesized relations in the model, prior research suggested that African-American students in performance goal environments may be more susceptible to experiencing debilitating emotions in comparison to

European-American students (Kaplan & Maehr, 1999a). In the current study, there was no evidence that the groups differed in the experience of debilitating emotions. Similarly, prior work has also suggested that in the context of performance classroom environments, African-Americans experienced greater difficulty controlling their emotional responses in comparison to their European-American counterparts (Kaplan & Maehr, 1999). These findings were also not replicated in this study, as there were no ethnic differences in reported use of emotion regulation strategies. These findings are not surprising because the literature on achievement goals has not consistently examined ethnicity as a moderator and has been frequently validated in diverse, representative samples (Blackwell et. al, 2007; Dweck, 1982; Middleton, Kaplan, & Midgley, 2004; Mueller & Dweck, 1998).

LIMITATIONS

Although this study attempted to assess emotional responses in test-taking situations, the ability to obtain assessments close enough to the actual test in school populations is often difficult. The lapse in time between the actual test and the completion of survey questionnaires may actually dampen or heighten the emotional responses that students report. In addition, emotional responses can be influenced by feedback that students receive about their performance on the test. For example, it may be the case that a student felt anxious during a test, but if the student scored well on the exam, feelings of anxiety may be minimized when reflecting on the exam. Indeed, this can also work in the reverse, where students can heighten reports of emotional responses if they do poorly on the assessments.

In addition, the study could have been expanded to include emotional measure at Time One, during which time students reported information about their general affect in math class. Although a broad assessment, this would provide insight into the direction of relations between emotions and achievement goals. For example, it may be the case that debilitating emotional responses may precede performance-approach goals, rather than the direction proposed in the current model. Longitudinal assessments of emotional experience would be better able to determine directionality in this instance.

Future work in this area needs to more carefully examine the direction of these relations by considering the precise manner in which emotions emerge in test-taking settings. Whereas it is often difficult to measure retrospective emotional responses, it may be beneficial for researchers to use more precision with regard to emotional assessments (i.e., asking students what made them feel angry or shocked during the test).

This would allow us to identify the order in which emotions are experienced and tactics are used in classroom settings and fully understand how these processes relate to goal orientations.

Despite the limitations of this study, the quasi-longitudinal design employed did allow for measurement of classroom, home, and personal goal orientations before assessments of emotional responses were administered. Thus, this study can assert that student reports of performance goal orientations existed before students reported on their experiences during the target math test. In addition, though immediate reports of students' emotions could not be obtained, a substantial percentage of the students in the sample (48%) completed the assessment of their emotional experiences and strategies for regulating emotions at least 1-5 days after the exam in question.

FUTURE DIRECTIONS

Based on the evidence provided in this study, the model could be altered to further test some of the underlying mechanisms. For example, the model hypothesizes that debilitating emotional responses occur first, and then students engage in emotion regulation. It is quite possible that students could first engage in emotion regulation, and then experience emotional responses that impact achievement. Though there is no way to assess directionality given the current data, model fit can be compared using a more dynamic approach to consider how students experience emotions in academic environments.

As this study attempted to assess the specific impact of performance-approach goals on achievement, it may be beneficial to examine the role of mastery-approach goals with the current data. Though mastery goals were not hypothesized to relate to debilitating emotional experiences in this study, it may be the case that indeed, these goals are related to adaptive emotional experiences and may demonstrate a positive association to achievement outcomes. Similarly, it may be beneficial to explore the role of performance-avoidance goals in this particular model. Since there is more consistent evidence that performance-approach goals are linked to decrements in achievement and debilitating emotions, it may be the case they these goals will provide stronger links across this particular model.

POLICY IMPLICATIONS

This study presents several presents implications for policy, particularly with regard to the performance goal structure that is prevalent in middle school. In the current school climate where state and district level standards for performance are of critical importance, several elements of performance goal structures have been elevated in importance, including the need for students to meet performance standards and demonstrate their performance across a range of subject areas. Under these types of heightened performance environments, the results from this study suggest that students who engage in thought and rumination about their lack of preparedness and the importance of the test are subject to experience decreased achievement. This finding appears to be a reflection of the importance of testing in the broader school culture. In order to function in these environments, it may be beneficial for teachers to emphasize the specific strategies that are positively associated with achievement outcomes. These include tactics such as instructing students of the best ways to approach problems on math tests, such as trying to eliminate incorrect answers, or recalling how a particular problem parallels similar problems covered in the class. It may be the case that a re-emphasis of these types of problem solving strategies can encourage students to re-direct their focus from the amount of weight a particular test holds to immediate strategies to tackle difficult tests.

CONCLUSION

Expanding on current work in the field, there is evidence that goal orientations are associated with different patterns of emotion regulation and that both emotion regulation and emotions help to explain the relation between performance-approach goals and academic achievement. It appears that along with endorsing a performance-approach orientation, students are likely to engage in emotion-focused strategies such as self-blame and wishful thinking. The combination of these tactics and performance-approach goals is linked to decreased achievement outcomes. Although performance-approach goals were not associated with task-focusing processing strategies in this study, these strategies were positively linked to achievement outcomes. It may be the case that performance-approach students can benefit from the use of these strategies instead of emotion-focused processes.

Table 1. Descriptive Statistics for the Study Sample

$N = 328$

<i>Variable</i>		<i>Percentage</i>	<i>Mean</i>
Student Age	10	.6	12.53 (1.10)
	11	17.5	
	12	31.2	
	13	32.2	
	14	16.2	
	15	1.9	
	16	.3	
Student Grade Level	6 th	34.5	
	7 th	33.2	
	8 th	32.2	
Ethnicity	African-American	46.9	
	Asian	4.3	
	Euro-American	27.7	
	Hispanic	13.6	
	Other	7.5	
Gender	Male	41.6	
	Female	58.4	
Prior GPA			83.11 (14.46)
Math Unit Test Grade			71.42 (21.46)
Final Math Grade			80.06 (17.39)
Days since last math unit exam	Up to 5	48.4	
	6-10	23.8	
	11-15	16.1	
	16-20	11.7	
Benchmark Score (Math)	54% at or above grade level in study		
	50% at or above grade level in school population		

Table 2. Descriptive Statistics for Primary Study Variables

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>
Classroom Performance Goals	2.40	1.06	1.0-5.0
Home Performance Goals	3.12	0.95	1.0-5.0
Performance-Approach Goals	2.88	1.03	1.0-5.0
Entity Theory of Intelligence	3.24	0.84	1.0-6.0
Anger	1.74	0.73	1.0-5.0
Anxiety	2.11	0.85	1.0-5.0
Shame	1.57	0.72	1.0-5.0
Distress	1.73	0.84	1.0-5.0
Appraising & Task-focusing Strategies	3.32	0.51	1.0-5.0
Emotion-Focused Strategies	2.84	0.92	1.0-5.0
Teacher Report of Student Emotion Regulation	2.68	1.00	0.0-4.0

Table 3. Standardized Factor Loadings for Performance Goal Constructs

* = Eliminated

Class Performance Goals

In this class, it's important to get more answers right than other students.	.70
In this class, getting better scores than other students is the main goal.	.81
In this class, it's important to show how smart you are compared to others.	.86
In this class, the most important thing is to look smart.	.67
In this class, it's important to get higher scores on assignments than other students.	.76

Home Performance Goals

My parents don't like it when I make mistakes in my class work.	.60
My parents would like it if I could show that I'm better at class work than other students in my class.	.85
*My parents would like me to show others I'm good at class work.	Dropped
My parents think getting the right answers in class is very important.	.72
My parents would be pleased if I could show that class work is easy for me.	.50

Performance-Approach Goals (Personal)

*It's important to me that other students in my class think I am good at my class work.	Dropped
It's important to me that I look smart compared to others in my class.	.70
My goal is to get the math problems right so that I look smart in class.	.75
One of my goals is to show others that I'm good at my coursework in this class.	.62
One of my goals is to show others that class work in math is easy for me.	.76
One of my goals is to look smart in comparison to other students in my class.	.82

Table 4. Standardized Factor Loadings for Theories of Intelligence

Entity Theory of Intelligence Climate		
	You have a certain amount of intelligence, and you really can't do much to change it.	.73
Theory-Self .65	You're either smart or you're not, and there is really very little you can do about it.	.79
	You can learn new things, but you can't really change your basic intelligence.	.64
Theory – Others .55	Generally, the people around me believe that peoples' intelligence is relatively fixed.	.79
	Most of the people I come into contact with believe that intelligence is relatively fixed.	.71

Table 5. Standardized Factor Loadings for Debilitating Emotions

Anger Subscale	
I felt Irritated	.70
I felt Angry	.66
I felt Mad	.71
I felt Bitter	.65
*I felt Disgusted	dropped
I felt Annoyed	.65
I felt Hostile	.59
I felt Provoked	.65
I felt Defiant	.68
I felt Rebellious	.66
*I felt Enraged	dropped
*I felt Haughty	dropped
Anxiety Subscale	
I felt Afraid	.74
I felt Scared	.72
I felt Jittery	.63
I felt Shaky	.74
I felt Anxious	.44
I felt Panicky	.76
I felt Impatient	.62
I felt Nervous	.76
I felt Frustrated	.66
Distress Subscale	
I felt Sad	.70
I felt Downhearted	.76
I felt Discouraged	.79
I felt Upset	.73
I felt Distressed	.60
Shame Subscale	
I felt Ashamed	.78
I felt Guilty	.76
I felt Blameworthy	.81
I felt Repentant	.67
I felt Embarrassed	.66
I felt Inadequate	.68

Table 6. Standardized Factor Loadings for Emotion Regulation Items

Cognitive-Appraising Processes

Goal congruent: Does your test performance help you to reach your goals?

I would do a lot better in classes if there were no tests. (R) .64

My test grades are getting in the way of my graduation. (R) .73

My grades on tests lower my view of myself as a good student. .72

(R)

I don't do well on tests. (R) .70

Agency: Do you perceive yourself as being in control during testing?

I control how well I perform on a test. .77

I am responsible for my own test results. .74

It is my own fault if I don't do well on a test. .66

My performance on a test is up to me. .79

Testing problems efficacy: Can I handle problems during the test?

I can deal with whatever happens during tests. .66

I can usually figure out how to answer difficult questions. .80

I am confident that I can deal with unexpected questions on tests. .74

If I get confused during a test, I can usually reason my way out of it. .64

Task-focusing Processes: Maintaining one's focus on the test.

Task-focused strategy use

I work harder to find the main idea in the questions. .75

I try to reword questions I am having problems with into my own words. .69

I block out distracting thoughts by focusing on the test questions. .74

I look for the answers to questions I am having problems with in other questions. .67

I eliminate answers that I know are incorrect. .67

*I try to answer the test question by picturing where it is in my notes or reading materials. dropped

Table 6. (cont.) Standardized Factor Loadings for Emotion Regulation Items	
Regaining Task-focusing Processes: Attempting to regain one's focus on the test.	
<i>Importance reappraisal: De-emphasizing the importance of the test.</i>	
I remind myself the test is only one part of the class.	.74
*I try to keep the test's importance in perspective with other things in my life.	dropped
I tell myself that high test scores are not very important.	.50
I remind myself that tests can't show everything I have learned.	.71
<i>Tension-reduction: Efforts to reduce one's tension during the test.</i>	
I try to clear my head.	.77
I try to calm myself.	.82
I take a deep breath.	.68
I take a minute to relax.	.74
Emotion-focusing Processes: Unpleasant emotion focusing activities.	
<i>Wishful thinking: Wishing the problem or test would go away.</i>	
I hope a miracle will occur.	.77
I find myself wishing the test was over.	.73
I hope an answer will pop into my head.	.80
I hope the teacher decides to throw out some questions.	.68
<i>Self-blame: Self criticism about how one is handling the test.</i>	
I criticize myself for what is happening to me during the test.	.72
I get angry at myself for not knowing the material.	.82
I lecture myself about how I should have studied differently.	.74
I get upset with myself for not being better prepared.	.81

Table 7. Standardized Factor Loadings for Teacher Reported Student Emotion Regulation

Teacher Reports: Emotion Regulation	
*Can accept things not going his/her way.	dropped
Copes well with failure.	.75
Accepts legitimate imposed limits.	.96
Expresses needs and feelings appropriately.	.92
Thinks before acting.	.95
Can calm down when excited or wound up.	.92
*Can wait in line.	dropped
Is aware of the effect of his/her behavior on others.	.92
*Plays by the rules of the game.	dropped
Controls temper.	.90
Teacher Reports: Academic Behavioral Skills	
Functions well even with distraction.	.92
Is a self-starter.	.95
*Works well without adults.	dropped
Works well in a group.	.96
Stays on task.	.89
Pays attention.	.95
*Follows teacher directions.	dropped

Table 8. Estimated Correlations among Latent Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Class Performance	---												
2. Home Performance	.55***	---											
3. Performance-Approach Goal	.62***	.54***	---										
4. Entity Theory	.40***	.26***	.32***	---									
5. Anger	.28***	.20***	.13*	.22***	---								
6. Anxiety	.18***	.17**	.13*	.16**	.71***	---							
7. Shame	.28***	.21***	.16**	.21***	.78***	.66***	---						
8. Distress	.24***	.16*	.12*	.19***	.81***	.76***	.79***	---					
9. Appraising & Task Focusing Strategies	.01	.07	.09	-.12*	-.14*	-.07	-.13*	-.16**	---				
10. Emotion Focused Strategies	.28***	.33***	.37**	.25***	.35***	.47***	.32***	.38***	.10	---			
11. Teacher Report	-.14*	-.11	-.11	-.27***	-.26***	-.10	-.22***	-.18**	.21**	-.23***	---		
12. Math Test Grade	-.14*	.01	-.07	-.21***	-.21***	-.13*	-.21***	-.17**	.15**	-.21***	.36***	---	
13. Final Math Grade	-.20*	-.14**	-.15**	-.22***	-.21***	-.17**	-.17**	-.19***	.23***	-.15**	.45***	.51***	---

Note: *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 9. Model Fit Indices for Structural Models

		χ^2	<i>df</i>	<i>CFI</i>	<i>TLI</i>	<i>RMSEA</i>
Model 1	Test-taking Strategies, Activated Debilitating Emotions, & Test Grade	2436.32	2000	.96	.96	.03
Model 2	Test-taking Strategies, Activated Debilitating Emotions, & Final Grade	2651.28	1981	.94	.93	.03
Model 3	Test-taking Strategies, Deactivated Debilitating Emotions, & Test Grade	2144.36	1708	.96	.95	.03
Model 4	Test-taking Strategies, Deactivated Emotions, & Final Math Grade	2150.39	1708	.96	.95	.03
Model 5	Teacher-Rated Emotion Regulation, Activated Emotions, & Final Grade	1308.77	971	.97	.97	.03
Model 6	Teacher-Rated Emotion Regulation, Deactivated Emotions, & Final Grade	1157.05	827	.97	.97	.04

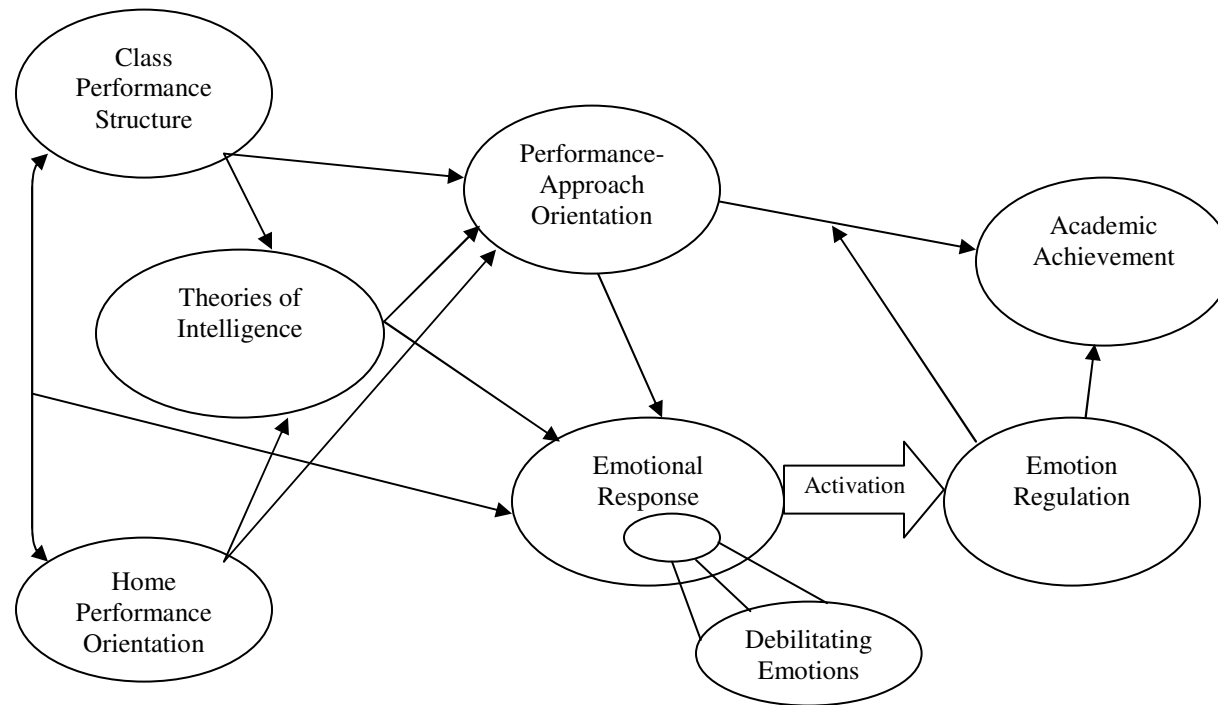


Figure 1. Conceptual Model: PARE Model – Performance-Approach and Regulation of Emotion

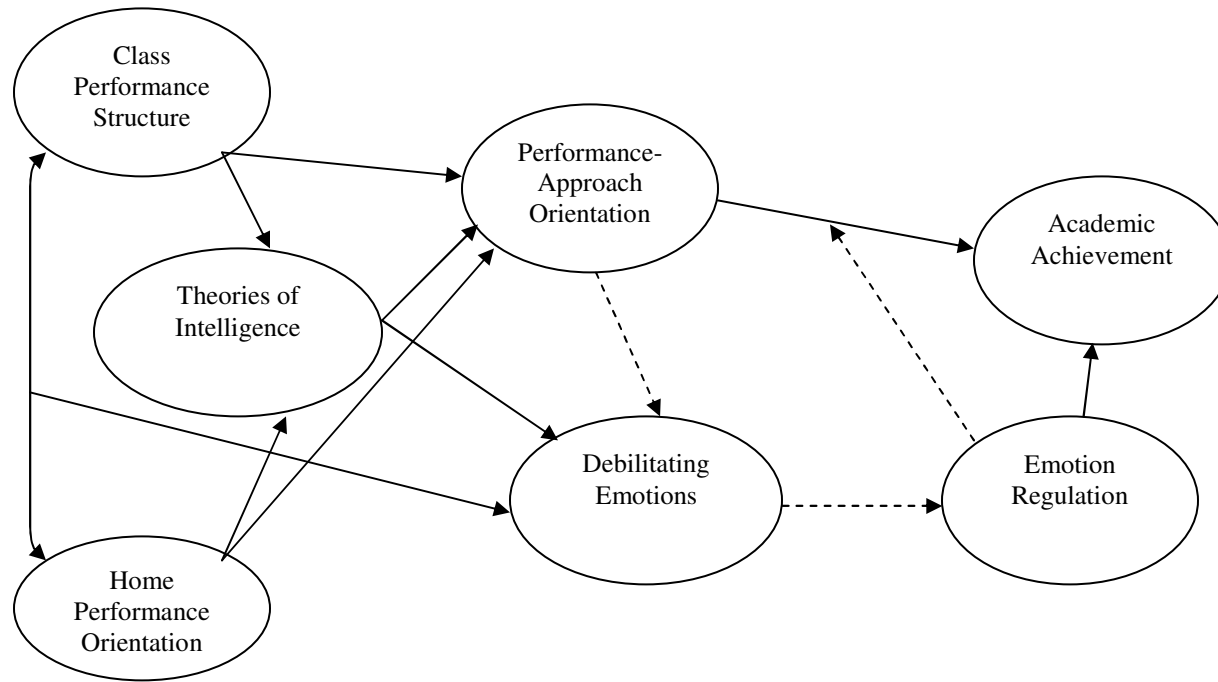


Figure 2. Overall Structural Model

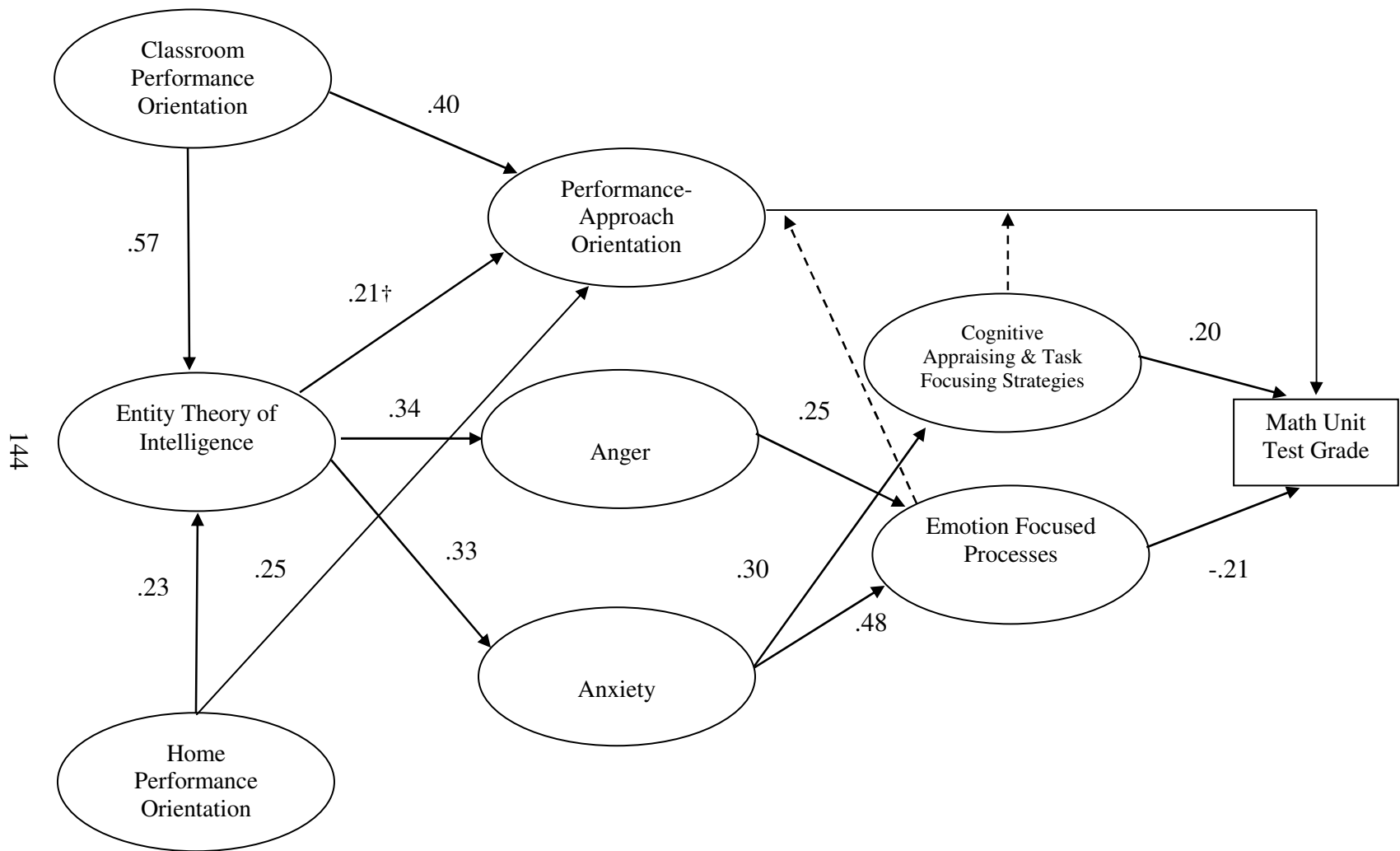


Figure 3. Test-taking Strategies, Activated Debilitating Emotions, & Test Grade

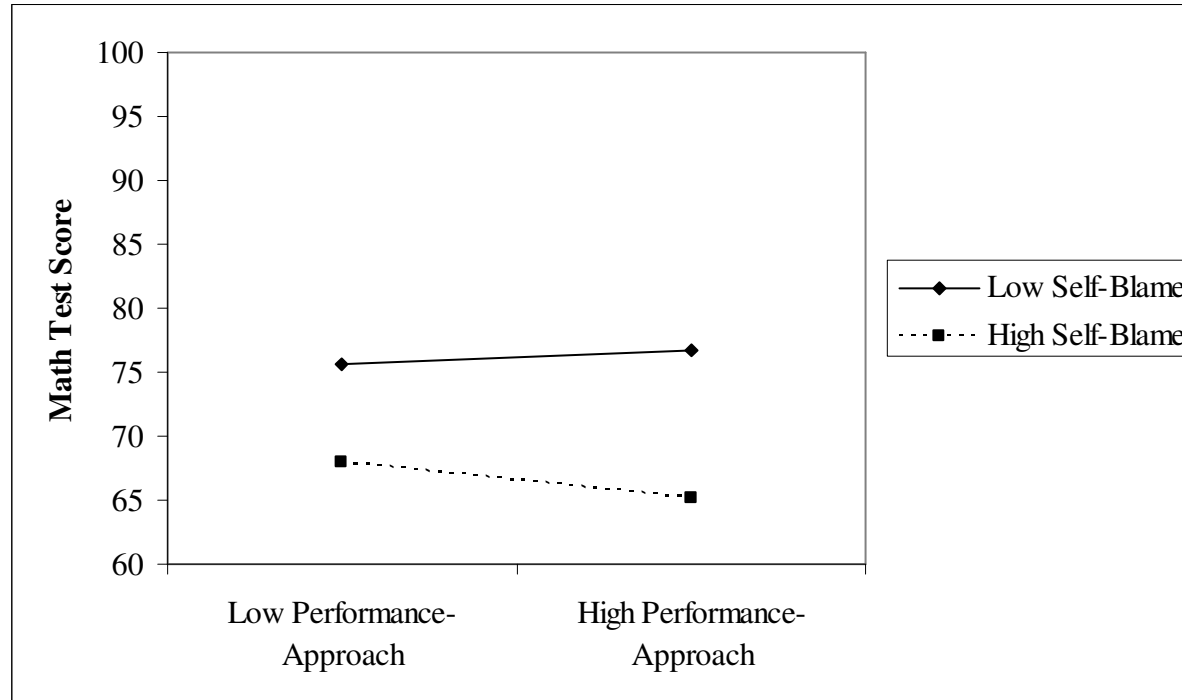


Figure 4. Interaction between Performance-Approach Goals and Self-Blame

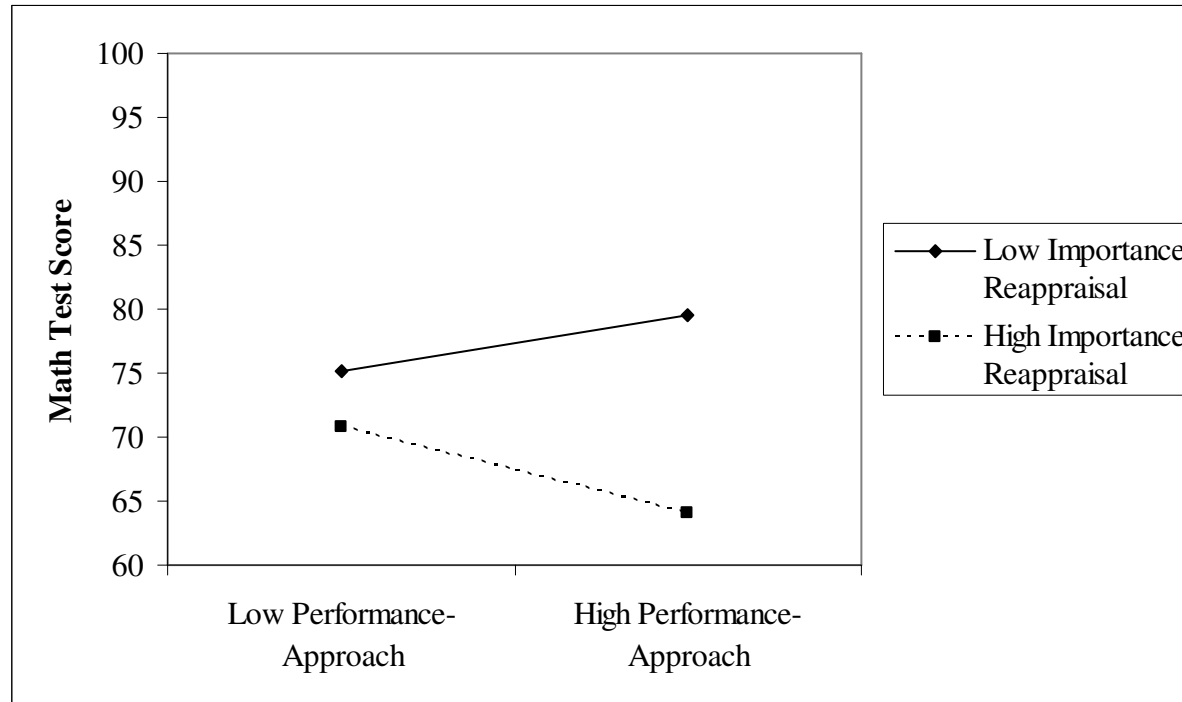


Figure 5. Performance-Approach Goals and Importance Reappraisal

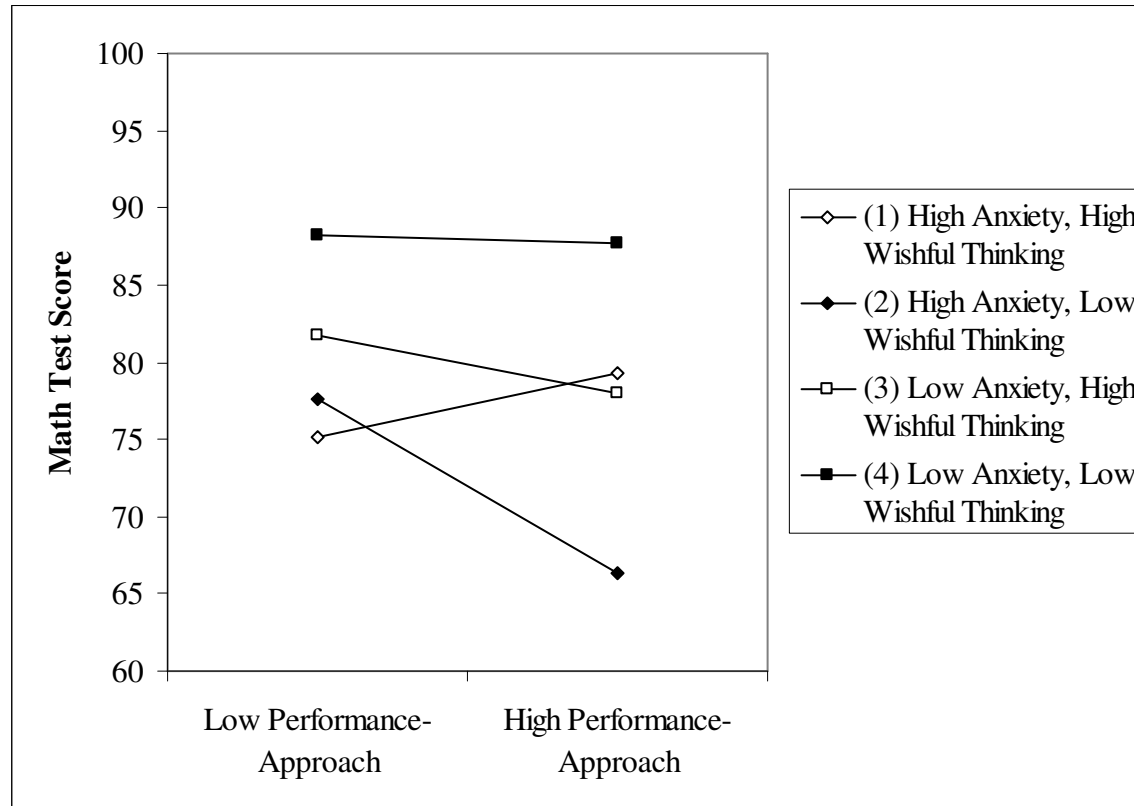


Figure 6. Three-way Interaction between Performance-Approach Goals, Anxiety, & Wishful Thinking

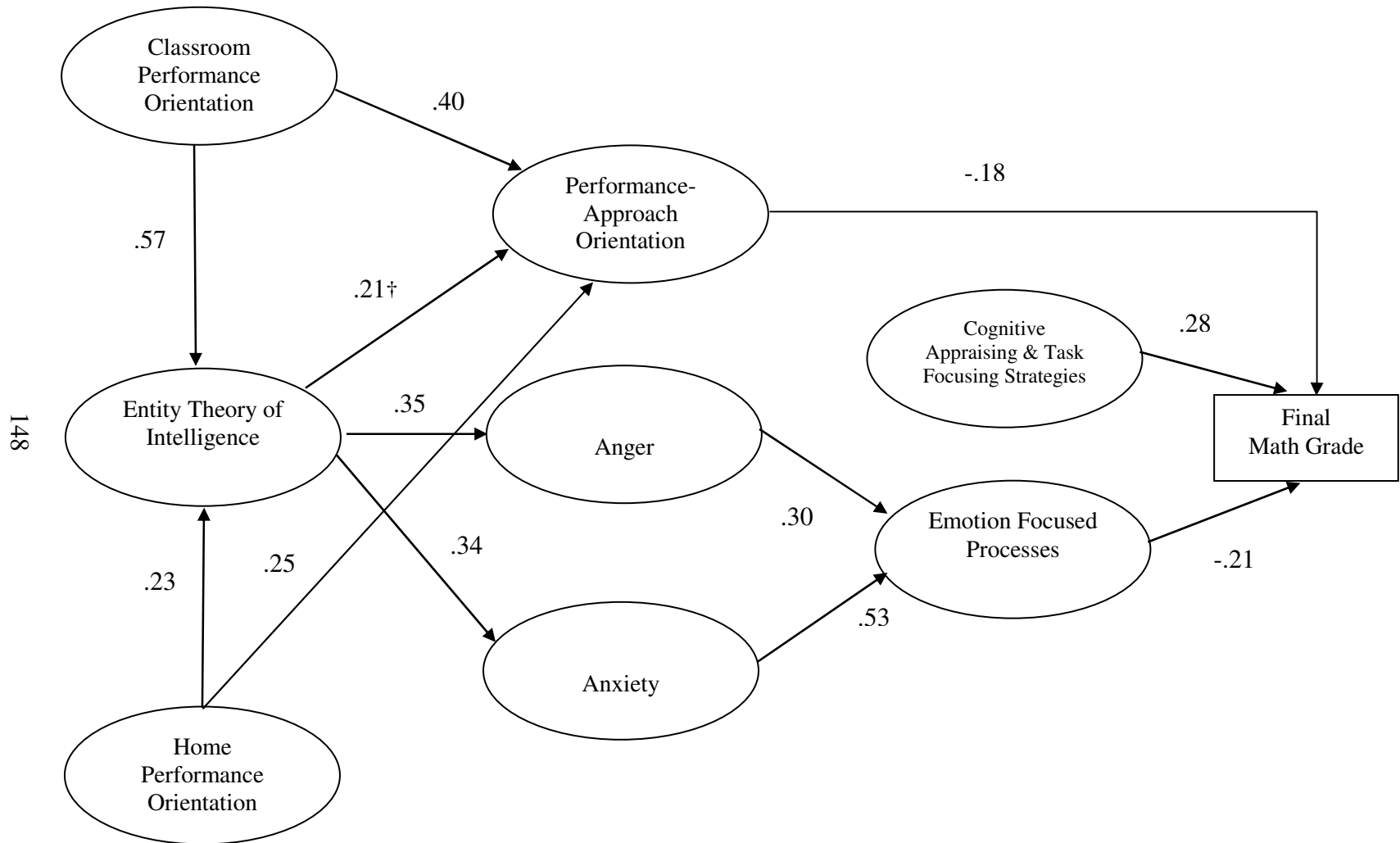


Figure 7. Test-taking Strategies, Activated Debilitating Emotions, & Final Grade

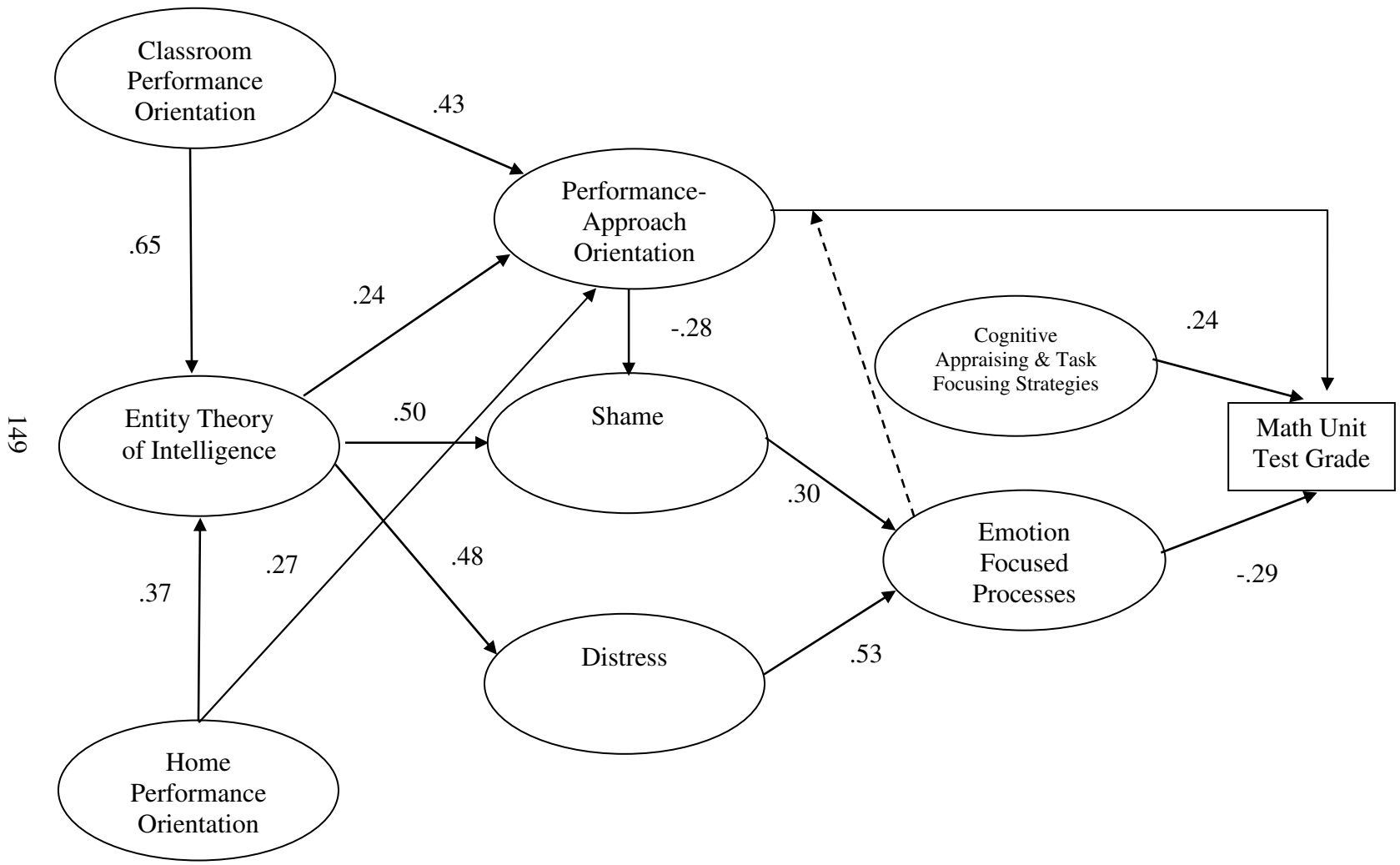


Figure 8. Test-taking Strategies, Deactivated Debilitating Emotions, & Test Grade

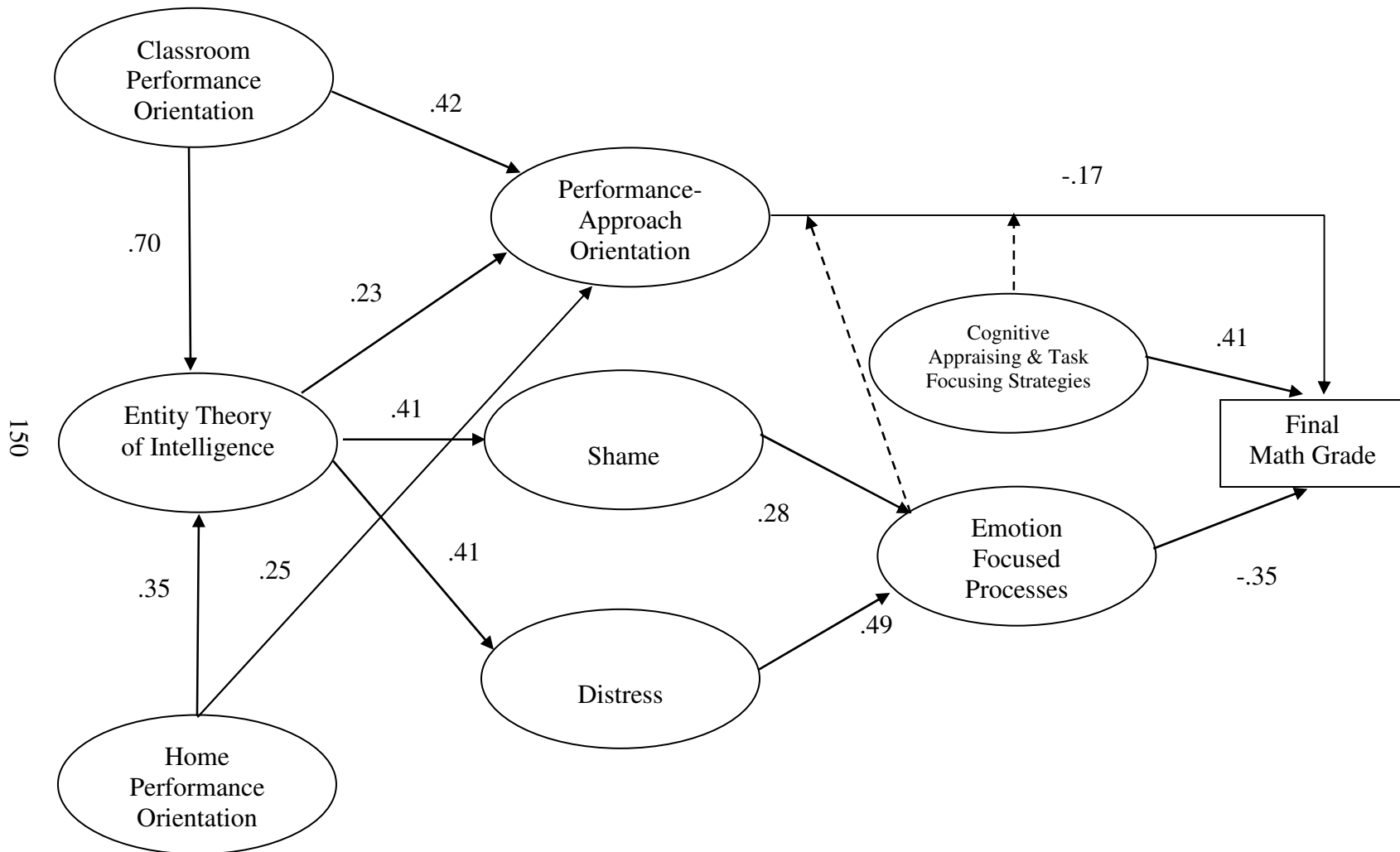


Figure 9. Test-taking Strategies, Deactivated Debilitating Emotions, & Final Grade

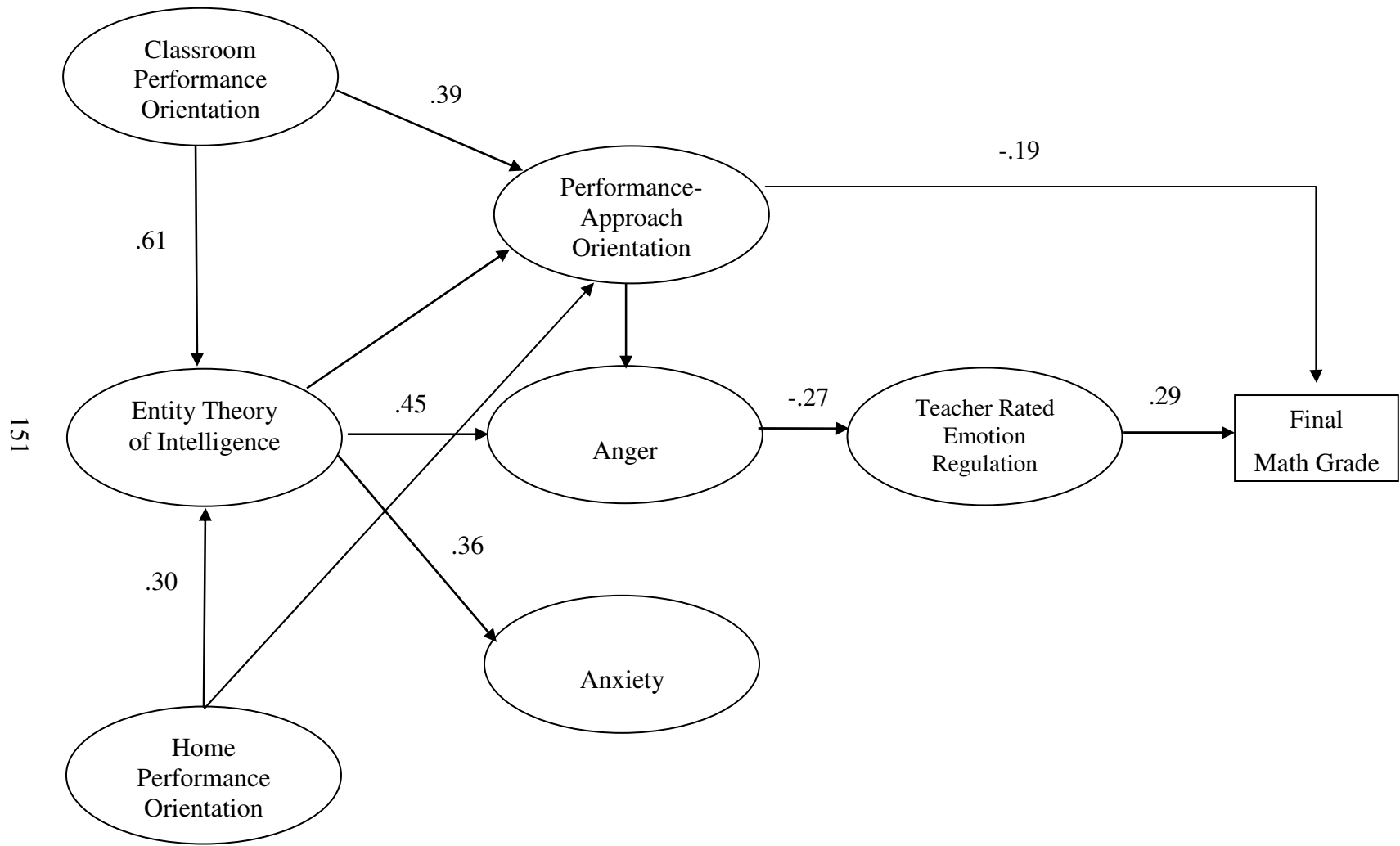


Figure 10. Teacher-Rated Emotion Regulation, Activated Debilitating Emotions, & Test Grade

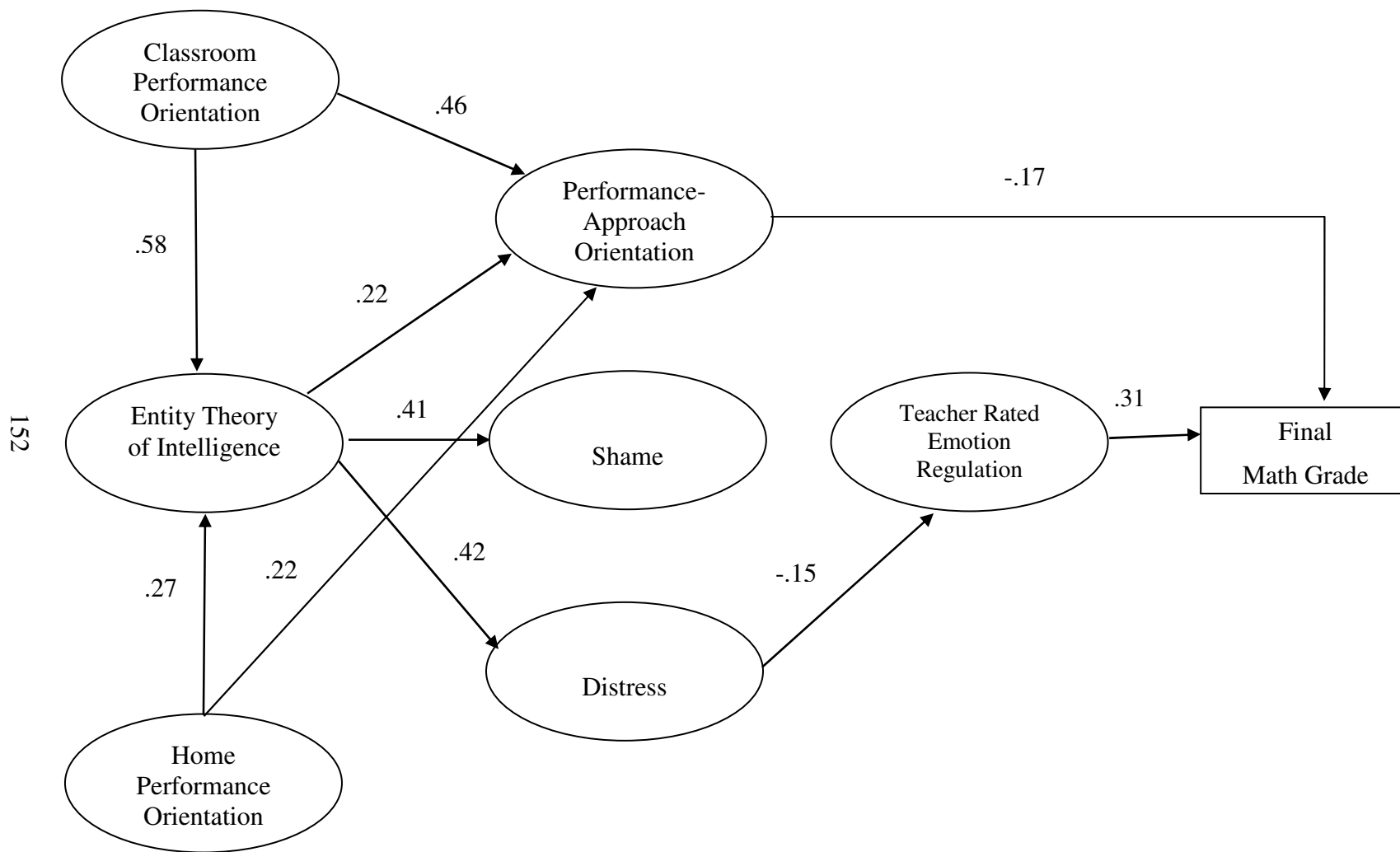


Figure 11. Teacher-Rated Emotion Regulation, Deactivated Debilitating Emotions, & Final Grade

REFERENCES

- Altschul, I., Oyserman, D., & Bybee, D. (2006). Racial-ethnic identity in mid-adolescence: Content and change as predictors of academic achievement. *Child Development, 77*, 1155-1169.
- Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261-271.
- Ames, C., & Archer, J. (1987). Mothers' beliefs about the role of ability and effort in school learning. *Journal of Educational Psychology, 79*, 409-414.
- Ames, C., & Ames, R. (1984). Systems of student and teacher motivation: Toward a qualitative definition. *Journal of Educational Psychology, 76*, 535-556.
- Anderman, E. M., Griesinger, T., & Westerfield, G. (1998). Motivation and cheating during early adolescence. *Journal of Educational Psychology, 90*, 84-93.
- Arunkumar, R., Midgley, C., & Urdan, T. (1999). Perceiving high or low home-school dissonance: Longitudinal effects on adolescent emotional and academic well-being. *Journal of Research on Adolescence, 9*, 441-466.
- Atkinson, J. W. (1964). *An Introduction to Motivation*. Princeton, N.J.: Van Nostrand.
- Atkinson, J.W., & Cartwright, D. (1964). Some neglected variables in contemporary conceptions of decision and performance. *Psychological Reports, 14*, 575-590.
- Barrett, K., & Morgan, G. (1995). Continuities and discontinuities in mastery motivation in infancy and toddlerhood: A conceptualization and review. In R.H. McTurk & G. Morgan (Eds.), *Mastery Motivation: Origins, Conceptualizations, and Applications* (pp.57-93). Norwood, NJ: Ablex.
- Barron, K. E., & Harackiewicz, J. M. (2001). Achievement goals and optimal motivation: Testing multiple goal models. *Journal of Personality and Social Psychology, 80*, 706-722.
- Baumeister, R. F. (2000). Ego depletion and the self's executive function. In A. Tesser, R. B. Felson, & J. M. Suls (Eds.), *Psychological Perspectives on Self and Identity* (pp. 9-33). Washington, DC: American Psychological Association.
- Blackwell, L. S., Trzesniewski, K. H., & Dweck, C.S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development, volume*, 246-263.

- Bamrind, D. (1971). Current patterns in parental authority. *Developmental Psychology*, 4(1, Pt.2), 1-103.
- Boekaerts, M. (1993). Being concerned with well-being and with learning. *Educational Psychologist*, 28, 148–167.
- Brown, J., & Weiner, B. (1984). Affective consequences of ability vs. effort ascriptions: Controversies, resolutions, and quandaries. *Journal of Educational Psychology*, 76, 146-158.
- Bouffard, T., Vezeau, C., & Bordeleau, L. (1998). A developmental study of the relation between combined learning and performance goals and students' self-regulated learning. *British Journal of Educational Psychology*, 68, 309-319.
- Butler, R. (1987). Task-involving and ego-involving properties of evaluation: Effects of different feedback conditions on motivational perceptions, interest, and performance. *Journal of Educational Psychology*, 79, 474-482.
- Cain, K.M., & Dweck, C.S. (1995). The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly*, 41, 25-52.
- Carver, C., & Scheier, M. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review*, 97, 19-35.
- Carver, C.S., Scheier, M.F., Weintraub, J.K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56 267-283.
- Chao, R. K. (1994). Beyond parental control and authoritarian parenting style: Understanding Chinese parenting through the cultural notion of training. *Child Development*, 65, 1111-1119.
- Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology*, 93, 43-54.
- Cole, B., Matheson, K., & Anisman, H. (2007). The moderating role of ethnic identity and social support on relations between well-being and academic performance. *Journal of Applied Social Psychology*, 37, 592-615.
- Cole, P.M., Martin, S.E & Dennis, T.A. (2004). Emotion regulation as a scientific construct: Methodological challenges and direction child development research. *Child Development*, 75, 317-333.

- Covington, M.V, Omelich, C.L, & Schwarzer, R. (1986). Anxiety, aspirations, and self-concept in the achievement process: A longitudinal model with latent variables. *Motivation and Emotion, 10*, 71-88.
- Daly, L. E., & Bourke, G.J. (2000). Interpretation and uses of medical statistics. In L. E. Daly & G. J. Bourke (Eds.), *Describing Data: A Single Variable* (pp. 27-28). New York, NY: Blackwell Publishing.
- Diamond, L.M., & Aspinwall, L.G. (2003). Integrating diverse developmental perspectives on emotion regulation. *Motivation and Emotion, 27*, 1-6.
- Diener, C.I., & Dweck, C.S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology, 36*, 451-462.
- Diener, M.L., & Mangelsdorf, S.C. (1999). Behavioral strategies for emotion regulation in toddlers: Associations with maternal involvement and emotional expressions. *Infant Behavior & Development, 22*, 569-583.
- Dodge, K.A. (1991). Emotion and social information processing. In J. Garber & K.A. Dodge (Eds.), *The Development of Emotion Regulation and Dysregulation* (pp. 159-181). New York, NY: Cambridge University Press.
- Dweck, C. (2002). The development of ability conceptions. In J. Eccles & A. Wigfield (Eds.), *Development of Achievement Motivation* (pp. 57-88). San Diego, CA: Academic Press.
- Dweck, C.S., & Leggett, E. (1988). A social cognitive approach to motivation and personality. *Psychological Review, 95*, 256-273.
- Dweck, C.S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.
- Dweck, C.S., & Wortman, C. B. (1982). Learned helplessness, anxiety, and achievement motivation: Neglected parallels in cognitive, affective, and coping responses. In H. Krohne & L. Laux (Eds.), *Achievement, Stress, and Anxiety* (pp. 92-126). Washington, DC: Hemisphere.
- Eccles, J.S. (2004). Schools, academic motivation, and stage-environment fit. In R. M. Lerner, & L. Steinberg (Eds). *Handbook of Adolescent Psychology (2nd ed.)* (pp. 125-153). Hoboken, NJ: John Wiley & Sons, Inc.
- Eccles, J.S., Wigfield, A., Midgley, C., Reuman, D., Mac Iver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle schools on students' motivation. *Elementary School Journal, 93*, 553-574.

- Eccles, J. S., Lord, S., & Midgley, C. (1993). What are we doing to early adolescents? The impact of educational contexts on early adolescents. *American Journal of Education, 99*, 521-542.
- Egloff, B., Schmukle, S.C., Burns, L.R., & Schwerdtfeger, A. (2006). Spontaneous emotion regulation during evaluated speaking tasks: Associations with negative affect, anxiety expression, memory, and physiological responding. *Emotion, 6*, 356-366.
- Elliot, A.J. & Thrash, T.M. (2004). The intergenerational transmission of fear of failure. *Personality and Social Psychology Bulletin, 30*, 957-971.
- Elliot, A. J., & McGregor, H. A. (2001). A 2 X 2 achievement goal framework. *Journal of Personality & Social Psychology, 80*, 501-519.
- Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 169-189.
- Elliot, A. J., McGregor, H. A., & Gable, S. L. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91*, 549-563.
- Elliot, A. J. (1997). Integrating the "classic" and "contemporary" approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement* (Vol. 10, pp. 143-179). Greenwich, CT: JAI Press Inc.
- Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218-232.
- Elliott, E., & Dweck, C. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54*, 5-12.
- Gesten, E.L. (1976). A health resources inventory: The development of a measure of the personal and social competence of primary-grade children. *Journal of Consulting and Clinical Psychology, 44*, 775-786.
- Good, C.D., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology, 24*, 645-662.
- Grant, H., & Dweck, C. S. (2003). Clarifying achievement goals and their impact. *Journal of Personality & Social Psychology, 85*, 541-553.

- Graziano, P.O., Reavis, R.D., Keane, S.P., & Calkins, S.D. (2007). The role of emotion regulation in children's early academic success. *Journal of School Psychology, 45*, 3-19.
- Grolnick, W.S., Ryan, R. M. (1992). Parental resources and the developing child in school. In M.E. Procidano, Mary E and C.B. Fisher, (Eds.), *Contemporary Families: A Handbook for School Professionals*. (pp. 275-291). New York, NY: Teachers College Press.
- Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*, 348-362.
- Gross, J.J. (1999). Emotion regulation: Past, present, & future. *Cognition and Emotion, 13*, 551-573.
- Gross, J. (1998). The emerging field of emotion regulation: An integrative review. *General Review in Psychology, 2*, 271-299.
- Gutman, L.M. (2006). How student and parent goal orientations and classroom goal structures influence the math achievement of African Americans during the high school transition. *Contemporary Educational Psychology, 31*, 44-63.
- Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology, 94*, 638-645.
- Harackiewicz, J. M., Barron, K. E., Tauer, J. M., & Elliot, A. J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology, 94*, 562-575.
- Harackiewicz, J. M., Barron, K. E., Tauer, J. M., Carter, S. M., & Elliot, A. J. (2000). Short-term and long-term consequences of achievement goals: Predicting interest and performance over time. *Journal of Educational Psychology, 92*, 316-330.
- Harackiewicz, J. M., Barron, K. E., Elliot, A. J., Carter, S. M., & Lehto, A. T. (1997). Predictors and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology, 73*, 1284-1295.
- Harter, S., Bresnick, S., Bouchey, H., & Whitesell, N. (1997). The development of multiple role-related selves during adolescence. *Development and Psychopathology, 9*, 835-853.

- Harven, Initials, & Graham, Initials (2006). The Relation between Adolescents' Perceptions of Racial Discrimination and their Achievement Goals: An Exploratory Study. Poster presented at the *Society for Research in Adolescence*, March 2006, San Francisco.
- Hessler, D.M., & Fainsilber Katz, L. (2007). Children's emotion regulation: Self-report and physiological response to peer provocation. *Developmental Psychology*, *43*, 27-38.
- Heyman, G.D., & Dweck, C.S. (1992). Achievement goals and intrinsic motivation: Their relation and their role in adaptive motivation. *Motivation and Emotion*, *16*, 231-247.
- Hill, N.E. & Tyson, D.F. (in review). Parent involvement in middle school: A meta-analytic assessment of the strategies that promote success.
- Hill, N.E., Bromell, L., Tyson, D.F., & Flint, R. (in press). Do parents still matter during adolescence?: Developmental, cultural, and contextual perspectives. *Journal of Clinical Child and Adolescent Psychology*, volume, pages.
- Hill, N.E, Castellino, D. R., Lansford, J.E., Nowlin, P., Dodge, K.A., Bates, J.E., & Pettit, G.S. (2004). Parent academic involvement as related to school behavior, achievement, and aspirations: Demographic variations across adolescence. *Child Development*, *75*, 1491-1509.
- Izard, C. E. (1972). *Patterns of Emotions*. New York: Academic Press.
- John, O.P., & Gross, J.J. (2004). Healthy and unhealthy emotion regulation: Personality processes, individual differences, and life span development. *Journal of Personality*, *72*, 1301-1333.
- Kamins, M., & Dweck, C.S. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology*, *35*, 835-847.
- Kaplan, A., & Maehr, M. L. (1999a). Achievement goals and student well-being. *Contemporary Educational Psychology*, *24*, 330-358.
- Kaplan, A., & Maehr, M.L. (1999b). Enhancing the motivation of African American students: An achievement goal theory perspective, *Journal of Negro Education*, *68*, 23-41.
- Kaplan, A., & Midgley, C. (1997). The effect of achievement goals: Does level of perceived academic-competence make a difference? *Contemporary Educational Psychology*, *22*, 415-435.

- Kinlaw, R. C., & Kurtz-Costes, B. (2003). The development of children's beliefs about intelligence. *Developmental Review, 23*, 125-161.
- Linnenbrink, E. A. (in press). The role of affect in student learning: A multi-dimensional approach to considering the interaction of affect, motivation, and engagement. In P. Schutz & R. Pekrun (Eds.), *Emotions in Education*. Academic Press.
- Linnenbrink, E.A., & Fredericks, J.A. (2007). Developmental Perspectives on Achievement Motivation: Personal and Contextual Influences. In J. Y. Shah & W. L. Gardner, *Handbook of Motivation Science: The Social Psychological Perspective* (pp.). New York: Guilford.
- Linnenbrink, E. A. (2005). The dilemma of performance-approach goals: The use of multiple goal contexts to promote students' motivation and learning. *Journal of Educational Psychology, 97*, 197-213.
- Linnenbrink, E. A., & Pintrich, P. R. (2002). Achievement goal theory and affect: An asymmetrical bidirectional model. *Educational Psychologist, 37*, 69-78.
- Linnenbrink, E. A., Ryan, A. M., & Pintrich, P. R. (1999). The role of goals and affect in working memory functioning. *Learning & Individual Differences, 11*, 213-230.
- Maehr, M. L. (2001). Goal theory is not dead--Not yet, anyway: A reflection on the Special Issue. *Educational Psychology Review, 13*, 177-185.
- Maehr, M. L., & Anderman, E. (1993). Reinventing schools for early adolescents: Emphasizing task goals. *Elementary School Journal, 93*, 593-610.
- Maehr, M. L., & Midgley, C. (1991). Enhancing student motivation: A schoolwide approach. *Educational Psychologist, 26*, 399-427.
- McClelland, D.C., Atkinson, J.W., Clark, R.A., & Lowell, E.L. (1953). Origins of achievement motivation. In D.C. McClelland, J.W. Atkinson, & R.A. Clark (Eds.) *The Achievement Motive*, (pp. 275-318). City, State: Publisher.
- McLoyd, V.C., & Smith, J. (2002). Physical discipline and behavior problems in African American, European American, and Hispanic children: emotional support as a moderator. *Journal of Marriage and Family, 64*, 40-53.
- Meece, J. L., Blumenfeld, P., & Hoyle, R. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80*, 514-523.

- Middleton, M. J., Kaplan, A., & Midgley, C. (2004). The change in middle school students' achievement goals in mathematics over time. *Social Psychology of Education, 7*, 289-311.
- Middleton, M., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An under-explored aspect of goal theory. *Journal of Educational Psychology, 89*, 710-718.
- Midgley, C., Anderman, E., Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *Journal of Early Adolescence, 15*, 90-113.
- Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology, 93*, 77-86.
- Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., Anderman, E., & Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology, 23*, 113-131.
- Mueller, C.M., & Dweck, C.S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality & Social Psychology, 75*, 33-52.
- Murdock, T.B., Hale, N.M., & Weber, M.J. (2001). Predictors of cheating among early adolescents: Academic and social motivations. *Contemporary Educational Psychology, 26*, 96-115.
- Newman, R. S. (1998). Students' help-seeking during problem solving: Influences of personal and contextual goals. *Journal of Educational Psychology, 90*, 644-658.
- Nicholls, J.G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R. Sternberg & J. Kolligian (Eds.), *Competence Considered* (pp. 11-40). New Haven: Yale University Press.
- Nicholls, J.G., Cheung, P.C., Lauer, J., & Patashnick, M. (1989). Individual differences in academic motivation: Perceived ability, goals, beliefs, and values. *Learning and Individual Differences, 1*, 63-84.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*, 328-346.

- Nicholls, J.G. (1979). Development of perception of own attainment and causal attributions for success and failure in reading. *Journal of Educational Psychology*, 71, 94-99.
- Niedenthal, P.M., Krauth-Gruber, S., & Ric, F. (2006) Regulation of emotion. In A. Kruglanski (Ed.), *Psychology of emotion: Interpersonal, experiential, and cognitive approaches* (pp.). New York, NY: Psychology Press.
- Nolen, S. B., & Haladyna, T. M. (1990). Motivation and studying in high school science. *Journal of Research in Science Teaching*, 27, 115-126.
- Pekrun, R., Elliot, A. J., & Maier, M.A. (2006). Achievement goals and discrete achievement emotions: A theoretical model and prospective test. *Journal of Educational Psychology*, 98, 583-597.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational Psychologist*, 37, 91-106.
- Phinney, J. (1992). The Multigroup Ethnic Identity Measure: A new scale for use with adolescents and young adults from diverse groups. *Journal of Adolescent Research*, 7, 156-176.
- Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, 95, 667-686.
- Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology*, 92(3), 544-555.
- Pintrich, P. R., & Garcia, T. (1991). Student goal orientation and self-regulation in the college classroom. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in Motivation and Achievement* (Vol. 7, pp. 371-402). Greenwich, CT: JAI Press.
- Pomerantz, E.M., Ng, F.F., & Wang, Q. (2005). Mothers' mastery-oriented involvement in children's homework: Implications for the well-being of children with negative perceptions of competence. *Journal of Educational Psychology*. 98, 99-111.
- Porges, S.W., Doussard-Roosevelt, J.A., & Maiti, A.K. (1994). Vagal tone and physiological regulation of emotion. *Monographs of the Society for Research in Child Development* 59 (1, No. 2 of 3), pages.
- Reijntjes, A., Stegge, H., Terwogt, M. M., Kamphuis, J. H., & Telch, M.J. (2006). Emotion regulation and its effects on mood improvement in response to an in vivo peer rejection challenge. *Emotion*, 6, 543-552.

- Revelle, W., & Loftus, D. (1990). Individual differences and arousal: Implications for study of mood and memory. *Cognition and Emotion*, 4, 209-237.
- Richards, J.M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, 79, 410-424.
- Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, 88, 408-422.
- Ruble, D.N., Eisenberg, R. & Higgins, T. (1994). Developmental changes in achievement evaluation: Motivational implications of self-other differences. *Child Development*, 65, 1095-1110.
- Ryan, A., Gheen, M.H., & Midgely, C. (1998). Why do some students avoid asking for help?: An examination of the interplay among students' academic self-efficacy, teachers' social emotional role, and classroom goal structure. *Journal of Educational Psychology*, 90, 528-535.
- Saarni, C. (1990). Emotional competence: How emotions and relationships become integrated. In R. A. Thompson (Ed.), *Nebraska Symposium on Motivation: Socioemotional Development* (pp. 115-182). Lincoln, NE: University of Nebraska Press.
- Sarason, I.G. (1984). Stress, anxiety, and cognitive interference: Reactions to tests. *Journal of Personality and Social Psychology*, 46, 929-938.
- Schutz, P.A., Hong, J.Y., Cross, D.I., & Osbon, J.N. (2006). Reflections on investigating emotion in educational activity settings. *Educational Psychology Review*, 18, 343-360.
- Schutz, P. A., & DeCuir, J. T. (2002). Inquiry on emotions in education. *Educational Psychologist*, 37, 125-135.
- Schutz, P.A., & Davis, H.A. (2000). Emotions and self-regulation during test-taking. *Educational Psychologist*, 35, 243-256.
- Schaffer, D.R. (1998). The concept of achievement motivation. In S. Purvance (Ed.), *Social and Personality Development*. (pp. 199-228). Belmont, C.A.: Wadsworth Press.
- Sellers, R. M., Rowley, S. A. J., Chavous, T. M., Shelton, J. N., & Smith, M. (1997). Multidimensional Inventory of Black Identity: Preliminary investigation of

- reliability and construct validity. *Journal of Personality and Social Psychology*, 73, 805-815.
- Shah, J.Y. (2003). The motivational looking glass: How significant others implicitly affect goal appraisals. *Journal of Personality and Social Psychology*, 85, 424-439.
- Sideridis, G.D. (2005). Goal orientation, academic achievement, and depression: Evidence in favor of a revised goal theory framework. *Journal of Educational Psychology*, 97, 366-375.
- Skaavik, E. M. (1997). Self-enhancing and self-defeating ego-orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology*, 89, 71-81.
- Steele, C. M. (1997). A threat in the air: How stereotypes shape the intellectual identities and performance of women and African-Americans. *American Psychologist*, 52, 613-629.
- Steinberg, L., Mounts, N. S., Lamborn, S. D., & Dornbusch, S. M. (1991). Authoritative parenting and adolescent adjustment across varied ecological niches. *Journal of Research on Adolescence*, 1, 19-36.
- Stipeck, D., Recchia, S. & McClintic, S. (1992). Self-evaluation in young children. *Monographs of the Society for Research in Child Development*, 57, (No. 226), pages.
- Thompson, R. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, 59(1, No. 2 of 3), pages.
- Tyson, D.F., & Linnenbrink, E.A. (2006). Investigating a self-regulatory model of achievement goals: The role of emotion regulation, affect, and cognition. Paper presented at the annual meeting of the *American Psychological Association*, August 2006, New Orleans, LA.
- Tyson, D.F. Adams, J.A. & Hill, N.E. (2005). Goal Orientation and Achievement: The Moderating Role of Emotion Regulation. Paper presented at the annual meeting of the *American Psychological Association*, August, 2005, Washington, D.C.
- Weiner, B. (1990). History of motivational research in education. *Journal of Educational Psychology*, 82, 616-622.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.
- Weiner, B. (1966). The role of success and failure in the learning of easy and complex tasks. *Journal of Personality and Social Psychology*, 3, 339-344

Weiner, B. (1965). The effects of unsatisfied achievement motivation on persistence and subsequent performance. *Journal of Personality*, 33, 428-443.

Weiner, B., Russell, D., & Lerman, D. (1979). The cognition-emotion process in achievement-related contexts. *Journal of Personality and Social Psychology*, 37, 1211-1220.

Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology*, 96, 236-250.

Wolters, C., Yu, S., & Pintrich, P. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences*, 8, 211-238.

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