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Linking goals to outcomes: Exploring students' achievement goals, strategy use, and standards of success for learning

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Linking goals to outcomes: Exploring students' achievement goals, strategy use, and standards of success for learning

Abstract
This study explored stability in achievement goals and learning behaviors within a two-part learning project. Based on previous literature exploring stability in achievement goal orientation, it was hypothesized that students' goals and self-efficacy would show evidence of change within and between the two task sessions. This was tested through a series of self-report surveys. Literature on the relationship between achievement goals and reading strategies showed that mastery oriented students used more reading strategies than performance oriented students. This was tested by imposing a performance oriented measure on one half of the participants. Data was analyzed with quantitative methods. Findings from this study supported only the first hypothesis. Goals and self-efficacy showed evidence of instability within and between the two sessions. However, students in both the performance and mastery conditions used similar learning behaviors. This suggests learning projects are an important area on which motivation research should continue to focus.

Keywords
Education, Educational Psychology, Education, Reading, Psychology, Cognitive

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LINKING GOALS TO OUTCOMES:
EXPLORING STUDENTS’ ACHIEVEMENT GOALS, STRATEGY
USE, AND STANDARDS OF SUCCESS FOR LEARNING.

BY
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DISSERTATION

Submitted to the University of New Hampshire
in Partial Fulfillment of
the Requirement for the Degree of

Doctor of Philosophy

in

Education

May, 2011
This dissertation has been examined and approved.

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DEDICATION

This is for Grant, who was often the only one out of the two of us who believed that I could—and would—actually get this done. I hope that I have made you proud.
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However, students in both the performance and mastery conditions used similar learning behaviors. This suggests learning projects are an important area on which motivation research should continue to focus.
CHAPTER ONE

INTRODUCTION

Introduction

In elementary school classrooms, students are presented daily with learning opportunities. Whether or not they will engage with these opportunities relies on their motivation for learning, and success on these tasks is determined by their ability to regulate their learning behaviors. As researchers are able to learn more about students’ motivation for learning, they are also able to understand more about students’ use of self-regulated behaviors such as reading strategies. These two dimensions of learning overlap when students set achievement goals for a learning task. Students’ goals for a specific task may be influenced by a number of factors, including the learning context and the individual learner.

Although there has been a great deal of research measuring changes in students’ achievement goals over significant periods of transition, less is known about goal stability between individual tasks, particularly when those tasks are related in some way, such as the tasks that make up a multi-step project. A learning project was used as the framework for data collection in this study.
because it has been shown that projects increase students' motivation for learning and strategy use. It was hypothesized that this increase in motivation comes from the emphasis on the learning process over normative assessment. This provided a unique opportunity to examine the impact of introducing a normative assessment into a learning project on students' reading strategy use. Findings from this portion of the study lend credence to the efficacy of learning projects for increasing learning-oriented motivation.

**Achievement Goal Theory**

One framework researchers have used to understand students' academic motivation is Achievement Goal Theory, which explains motivated behaviors in terms of the goals students chose to work toward. Students may endorse either a mastery or a performance goal for an academic task. (Ames, 1992; Linnenbrink & Pintrich, 2002; Meece, Anderman & Anderman, 2006; Turner, et al., 2002) Traditionally, mastery goals are conceptualized as developing personal competence, gaining enjoyment from learning, and increasing valued skills. Performance goals, which have often been situated as antithetical to mastery goals, are thought of as being directed at demonstrating competence, particularly in comparison to peers. (Baranik Stanley, Bynum, & Lance, 2010; Elliot, McGregor, & Gable, 1999) More recent refinement of achievement goals has delineated between an approach and an avoidance valence for each of these two...
goal orientations. Students who choose to approach goals, whether mastery or performance, actively engage in academic tasks and employ specific behaviors that help them achieve their goal. On the other hand, students who adopt an avoidance valence will choose behaviors that help them to elude what they perceive to be a threatening situation. (Baranik, Stanley, et al, 2010; Elliot & McGregor, 2001)

Goal orientation is of particular interest in a study of learning behaviors because it has been shown to relate to specific patterns of strategy use. (Aarnoutse & Shellings, 2003; Guthrie & Wigfield, 1997; He, 2005) Mastery goals have been linked with an increase in the number of strategies students report using. (Schraw, Horn, Thorndike-Christ, & Bruning, 1995; Wolters, 2004) Readers use strategies to support their comprehension of a text. Strategies that good readers use include activating prior knowledge, questioning the text, summarizing what they have read, drawing conclusions and inferences, and monitoring their understanding. (Guthrie & Wigfield, 1997; He, 2005; Pressley, 2002) Research has consistently found that increased motivation for reading is positively correlated with effective strategy use, comprehension, and time spent reading, all of which lead to better achievement outcomes. (Aarnoutse & Shellings, 2003; Guthrie & Wigfield, 1997; Gottfried, 1990; Hidi & Harackiewicz, 2001)
Research has also focused on how goals change over periods of transition. For example, research has shown that students' achievement goals change significantly as they make the move from elementary school to middle school. (Ames, 1992; Schunk, Pintrich, & Meece, 2008) Other research has shown that goals can change over short periods of time, such as a school year and a college semester (Fryer & Elliot, 2007; Senko & Harackiewicz, 2005) Whenever there is a transition, there is an opportunity for goals to change. These transitions may exist even in the moments between the individual tasks that students engage in on a day-to-day basis. One of the questions this study addressed was if achievement goals can change in the transition between related tasks. Previous research has tended to measure achievement goals only at one time relative to a reading task. That method is not able to measure small moments of transition during reading, which is the area of inquiry for this study. From within the context of this study, it was possible to measure participants' achievement goals at multiple times and on multiple tasks, contributing important insights to the existing body of literature.

In this study, it was hypothesized that students' achievement goals are not a single, stable concept but instead are fluid and change during the learning project. In order to uncover evidence of such a change in goal orientation, motivation was measured at several times throughout the learning project.
Reading Strategies for Comprehension

A second area of investigation was the relationship between the goal structure of the learning project and students’ use of strategies. Previous research has linked goal orientation to strategy use; typically, mastery oriented students use more deep processing strategies than do performance oriented students. (Meece & Miller, 2001) Academic motivation and the use of learning strategies do not come naturally to all students. A learning situation can have its own goals that influence the motivations, beliefs, and actions of students. (Elliot, 2009; Lutz, Guthrie, & Davis, 2006; Mueller & Dweck, 1998; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Patrick, Ryan, & Kaplan, 2007; Pintrich & DeGroot, 1990; Schunk, 2003; Turner, 1995, 1997) Often, teachers structure their classrooms and lessons to specifically encourage academic motivation. One such instructional practice that many teachers employ is the class project which gives students meaningful learning experiences. (Blumenfeld et al, 1991; Meyer, Turner, & Spencer, 1997)

Learning projects are typically interesting and engaging, and emphasize content mastery over test performance, and include at least some group work, all of which help to increase students’ academic motivation. Typically, projects begin with a reading assignment and include a writing component as well, creating a need for students to use adaptive learning behaviors, such as reading
strategies. With the motivational support from the learning project, students are more likely to use these strategies. (Bell, 2010; Blumenfeld, et al., 1991; Fryer & Elliot, 2007) Projects typically include several related tasks that culminate with the creation of an artifact meant to represent the sum of the learning process. (Bell, 2010) Like a traditional learning project, this study included reading and the creation of a physical artifact that participants could use to both gauge and demonstrate their learning, in this case a model zoo. The topic was considered to be interesting to most students, and they were allowed creative freedom in designing their zoo.

This study specifically used the context of the learning project to answer questions about students' motivation, as expressed by an Achievement Goal framework, and their use of learning behaviors such as reading comprehension strategies and note taking. Given the inherent mastery orientation of a learning project, (Bell, 2010; Fryer & Elliot, 2007) it is important to know what impact a performance oriented task might have on students' strategy use. Typically, projects are shown to increase students' mastery orientation and use of strategies. However, it is just as possible that the introduction of a performance task—such as a test—could undermine the positive influence of the project. It was hypothesized that students who were working on an overtly performance
oriented reading task would choose fewer mastery behaviors than their peers, despite the overall mastery structure of the project.

**Goal Outcome Standards**

Students’ outcome standards were an additional area of exploration. Before each task, students were asked how they would know if they had done well. This simple question provided new information about the standards of success that students set for themselves, and how those outcome standards are related to their achievement goals. Although outcome standards have been mentioned in the literature (Hidi & Harackiewicz, 2000; Latham & Brown, 2006; Meece, Anderman, & Anderman, 2006; Nicholls, 1984) there has been no systematic analysis of the role they play in achievement goal motivation or the use of learning behaviors. This study specifically intended to add the existing body of literature by beginning to explore this domain. In this study, outcome standards were defined at the marker students identified as being indicative of their success on a task. A sentence stem completion task was used to elicit responses from students; this particular method is also unique in studies of achievement goals and learning behaviors. However, it was included here because sentence completion tasks have a strong history in other domains of psychological research and practice.
Summary

This study was designed to answer three research questions:

1. Are there differences in motivation within and/or between tasks associated with a multi-step learning project?

2. Does the introduction of a performance oriented task impact students’ use of reading strategies during a mastery oriented project?

3. How do students’ outcome standards relate to their academic motivation?

Chapter two reviews the literature that led to the formation of these three questions. In some areas, an enormous amount of work has already been done, leading to a re-conceptualization of old questions. In other areas, work has barely begun, allowing for more exploratory questions to be asked. Chapter three outlines the methods and materials used for collecting data and ultimately answering these three research questions. The methods employed by this study are drawn from a number of domains. Some of the methods and instruments are common in research investigating achievement goals and strategy use; others are being used here for the first time. Chapter four presents the results of the data analysis as it pertains to the three research questions. Chapter five discusses the implications of these findings for future research and instructional practice, as
well as critically evaluating the limitations of this study and potential modifications that could be made.

Ultimately, this study is about providing more information to the community of researchers and practitioners who are interested in students' motivation and learning behaviors for the purpose of helping all students to experience academic success.
CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Each day, students are asked to participate in a number of academic tasks. Before engaging in a task, learners ask themselves three questions: “Can I succeed? Do I want to succeed and why? What do I need to do to succeed?” (Wigfield, 1997, pp.18-19) These questions encompass the main volitional and cognitive dimensions of learning: motivation and behavior. The first question can be answered by examining self-efficacy; the second, by achievement goals; and the third, by strategy use. These three elements mutually influence each other during task engagement. Self-efficacy may influence goal choice; goals in turn may enhance learning by directing behaviors such as reading comprehension strategies. (Schunk & Zimmerman, 1997)

Many studies of academic motivation have focused on reading. Students read for a variety of reasons. Some students read for enjoyment and challenge, while others read for grades, recognition, or competition with their peers. (Wigfield, 1997) Motivation for reading is important because it has been shown to increase the amount of reading that students do, as well as their strategy use
and comprehension during reading. (Guthrie, Toboado, & Coddington, 2007; Guthrie, Wigfield, Metsala, & Cox, 1999b)

In classrooms, teachers try to create contexts that endorse positive situational goals for learning in the hopes that students will internalize these as positive dispositional goals over time. Literature about project-oriented learning suggests that students' motivation is positively affected by participation in meaningful learning situations, leading to an increase in strategic behaviors. (Blumenfeld et al., 1991; Fryer & Elliot, 2007; Guthrie & Wigfield, 1997) While many studies have shown that goals can be changed over time through instructional practice, both for better and for worse, few studies have looked into a single task to understand the relation of the learning context to the goals and learning behaviors adopted by students. In this study, goals and learning behaviors will be examined within a single learning project. This close examination of students' achievement goals will provide more information about goal stability, the relationship between goals and strategy use, and the relationship between goals and standards for success as understood by student learners.

**Motivation and Academic Success**

Academic success can be understood as more than receiving good grades and test scores. It may also be about active engagement in learning tasks. This active engagement is generally called *motivation*. There are several different theories of
motivation that explain why we choose to engage in some activities but not others, and how we will behave during that engagement. (Bong, 2009) Theories of academic motivation explain students’ choice to engage in learning, their persistence and effort, and their cognitive and affective responses to participation in academic situations. (Bong, 2009; Gottfried, 1990; Graham & Weiner, 1996) They are particularly helpful for understanding students’ behaviors around learning, which is often effortful and challenging. In schools, students who are academically motivated will choose to engage in learning tasks, will use strategies to support their learning, and will expend energy directing their behavior toward learning. (Bong, 2009; Graham & Weiner, 1996) These theories share concepts between them that are consistently found to be related to motivated actions: interest, task-value, goals, self-efficacy, choice, challenge, self-regulation, and interest. (Aarnoutse & Schellings, 2003; Gottfried, 1985, 1990; Graham & Weiner, 1996; Linnenbrink & Pintrich, 2002; Paris & Turner, 1994; Ryan & Deci, 2000; Schunk, 2003; Sweet, 1997; Turner, 1995, 1997; Wigfield & Guthrie, 1997; Zimmerman, 1998)

Can I Succeed?

Self-Efficacy

The theory of self-efficacy in motivation postulates that the choices people make and their effort, persistence, and achievement for a task is directly related
to their sense of personal ability. (Bandura, 1982; Graham & Weiner, 1996; Linnenbrink & Pintrich, 2002; Metallidou & Vlachou, 2007; Pajares, 2003; Schunk, 2003; Schunk & Zimmerman, 1997) Beliefs in ability affect, in turn, motivation to participate in a task. Self-efficacy is not simply self-esteem, which is in fact a separate concept. It is a psychological construct of ability influenced in part by actual performance but also by beliefs about intelligence and effort in general, as well as information from the environment. People with a high sense of self-efficacy see themselves as possessing the required skills and strategies necessary to complete a task and believe that they are able to control their use of these strategies. Students with positive self-efficacy are likely to choose approach oriented goals, and to actively engage in academic tasks. Not surprisingly, research on self-efficacy has shown that it positively relates to academic outcomes. (Schunk, 2003; Schunk & Zimmerman, 1997)

Self-efficacy is not a fixed entity, and students can create a realistic sense of themselves as learners through both experience and direct communication with others. Building an appropriate level of self-efficacy comes from having authentic experiences with realistic feedback from peers or teachers. (Bandura, 1982; Schunk, 2003) In addition to external feedback, students must also self-evaluate to create an appropriate sense of self-efficacy. (Schunk, 2003) What is important for promoting self-efficacy is that the goal is met, which is more likely
to occur when goals are short-term, proximal, and have specific performance standards for judging achievement. (Graham & Weiner, 1996; Schunk & Zimmerman, 1997) Goals that require a long-term investment or too many intermediate steps before achievement may not provide enough feedback for students to judge their efficacy. Similarly, goals that have vague or flexible standards of success will frustrate students, again not giving them reliable information about achievement. Within a learning project, several “checkpoints” can be laid out for students to alert students that it is time to assess their progress—such as at the end of the interstitial tasks that make up the whole project.

Self-efficacy is most adaptive to learning when it is at an optimal level. (Schunk, 2003) Self-efficacy that is too low can lead to avoidance goals, low expectancy beliefs about a task, and low task value, as protective measures. (Linnenbrink & Pintrich, 2002; Schunk & Zimmerman, 1997) Students possessing an inappropriately high sense of self-efficacy may be overconfident in their ability. This may lead them to fail to use necessary strategies, believing that they do not have to expend effort to succeed, resulting in a poor task outcome. If a student’s level of self-efficacy is threatened in this way, in the future she may adopt avoidance goals and have a too-low sense of efficacy for similar tasks. (Linnenbrink & Pintrich, 2002) Students with a realistic sense of their own ability
and an appropriate sense of self-efficacy will actively pursue approach goals, have realistic task expectancies, high task values, and will successfully employ skills and strategies to achieve academic success. (Bandura, 1982; Schunk & Zimmerman, 1997)

Self-efficacy is related to a number of constructs that predict how a student will behave during academic tasks. It is continually found to be highly correlated with persistence on challenging tasks; students with a high sense of self-efficacy will continue to work at academic tasks even when their first efforts are not successful. (Pajares, 2003; Schunk, 2003) Self-efficacy has a significant relationship to self-regulatory behaviors, strategy use, and task engagement. (Guthrie & Wigfield, 1999; Schunk, 2003) In reading, self-efficacy positively predicts comprehension. This is particularly true when the text is seen as challenging but within the student’s ability level because it makes the reader feel that strategy use is necessary and possible. (Guthrie, Wigfield, Metsala, & Cox, 1999)

Self-efficacy for reading is also related to the self-regulatory behaviors, such as strategy use, that a reader will employ. (Guthrie et al., 2004; Kaplan, Middleton, Urdan, & Midgley, 2002; Schunk & Zimmerman, 1997) Self-regulation is a meta-behavior that stems from strong self-efficacy for learning tasks and knowledge of appropriate strategies, which has been shown to be
positively correlated with motivation for all types of activities, including reading. (Bandura, 1982; Zimmerman, 1995; 1998) It has been repeatedly shown that self-efficacy for a task is an important predictor for the use of self-regulatory strategies, which in turn predict task performance. (Metallidou & Vlachou, 2007; Pintrich & De Groot, 1990; Zimmerman, 1995; 1998) Students who have a high sense of efficacy for a reading task also need to believe that their competence stems from their active strategy use and effortful engagement in the reading task, as this will promote their continued use of strategies. (Hilden & Pressley, 2007)

Despite the seemingly straightforward nature of these findings, self-efficacy for literacy tasks can be somewhat complex. Research has shown that on tasks that have both skill and strategy components, such as reading does, there are levels of self-efficacy for each, with different relationships to outcomes. (Pajares, 2003) For example, a student might have a high sense of self-efficacy for a global sense of being able to accomplish a goal, but low self-efficacy for the component skills necessary to complete that task. In reading, this would be evidenced by students who report having high self-efficacy for reading, in general, but are reluctant to participate in tasks that require careful use of decoding skills or using comprehension strategies. It is this skill-level self-efficacy that is more highly correlated with actual outcomes. (Metallidou & Vlachou, 2007; Pajares, 2003)
Collective efficacy

When working autonomously, students’ beliefs about their capabilities are defined by self-efficacy. When students begin to work in groups, their capability beliefs are based on collective efficacy. Although self- and collective-efficacy stem from similar processes and provide similar functions, they are distinct constructs. (Bandura, 2002) Collective efficacy is the group’s shared belief that, by coordinating knowledge and skills, they can integrate their efforts and achieve a common goal. (Alavi & McCormick, 2008; Bandura, 2000) Even when the individuals in a group each have high self-efficacy for a task, collective efficacy may not be particularly strong. While self-efficacy relies on personal assessment of one’s capabilities, collective efficacy stems from the group’s ability to interact and organize its behaviors; if this doesn’t happen, the collective efficacy of the group will be low and performance may suffer. (Alavi & McCormick, 2008) Collective efficacy relates to many of the same outcomes as self-efficacy. The stronger a group’s collective efficacy, the more motivated that group will be, giving them greater persistence on challenging tasks, higher task value, and a better outcome. (Alavi & McCormick, 2008; Bandura, 2000)

Measuring collective efficacy can be done through the same general methods as measuring self-efficacy. However, because the two processes are distinct, collective efficacy should not be thought of as an aggregate of individuals’ self-
efficacy. Instead, collective efficacy should be measured as a separate construct that may be related to, but not the same as, self-efficacy. (Alavi & McCormick, 2008; Bandura, 2000)

Self-efficacy answers a learner’s question about her ability to succeed at a task. Having determined the answer to this first question, she is ready to ask herself if and why she wants to succeed.

Do I Want To Succeed And Why?

Achievement Goal Theory

Although academic motivation can be examined from several viewpoints; this study, and many others, have chosen to understand it through Achievement Goal Theory (AGT). This particular framework was adopted because AGT allows for a refined understanding of academic motivation in that it differentiates between the purposes that students may set for a learning task; these purposes are then linked to patterns of more or less adaptive behavior which may not be readily observable without this framework. (Graham & Weiner 1996; Kaplan, Middleton, Urdan, & Midgley, 2002) As work with achievement goals has continued over the past few decades, a continually more sophisticated delineation of students’ academic goals has emerged. While early theories of motivation may have described only the difference between those
students who do and do not engage in tasks, AGT distinguishes between the myriad reasons that students might have for task engagement and avoidance.

As the name implies, this theory is focused on the goals individuals strive for when engaged in learning tasks; this includes why they have chosen a particular goal, how their goal choice affects their learning behaviors, and how they gauge their successes. (Jagacinski, Kumar, Boe, Lam, & Miller, 2010; Kaplan, Middleton, Urdan, & Midgley, 2002; Midgley, Kaplan, & Middleton, 2001) The achievement goals that students choose for themselves, or adopt from their environment, have been shown to predict, among other things, their academic success and ability to retain information. (Baranik, Barron, & Finney, 2010)

AGT posits that learning can be seen either as a means to an end or as an end in itself. (Blumenfeld et al, 1991; Elliot, 1999; Graham & Weiner, 1996; Meece, Blumenfeld, & Hoyle, 1988; Meyer, Turner, & Spencer, 2010; Negru & Damian, 2010; Nicholls, 1984; Patrick, Anderson, Ryan, Edelin, & Midgley, 2001) When developing competence is the end, the focus is on task engagement itself, on the process of learning. Achievement is focused on the learning process, including perceived effort and sense of competence, and is unique to the individual. This is known as a mastery goal. On the other hand, when demonstrating competence is the end and learning is the means, students' focus is on a product that comes after learning, such as a grade or score on a final product, and
achievement is determined by comparing the products of individuals against one another; this is known as a performance goal. (Dweck & Leggett, 1988; Elliot, McGregor, & Gable, 1999; Kaplan, Middleton, Urdan, & Midgley, 2002; Linnenbrink, 2005; Meece, Blumenfeld, & Hoyle, 1988; Midgley, Kaplan, & Middleton, 2001; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001) Another way to think of these two stances is that one goal is directed at developing knowledge, while the other goal demonstrates it. (Meece, Anderman, & Anderman, 2006; Nicholls, 1984)

In recent reviews of AGT literature, there has been some discussion about the terms used to label each of these goal orientations. According to Hulleman, Schrager, Bodman, & Harackiewicz (2010) all goals share common characteristics; the difference is in how those characteristics are expressed by the student. In general, all goals are internal representations, focused on the future, used to direct behavior either towards or away from an object or outcome. (Hullemen et al, 2010) Goals stemming from an internal desire to understand content or to excel at a skill have been labeled task goals, or learning goals, as well as mastery goals. (Horowitz, 2010; Hulleman et al, 2010; Negru & Damian, 2010) External goals focusing on demonstrating competence have been called ego goals, ability goals, and performance goals. (Horowitz, 2010; Hulleman et al, 2010; Negru et al, 2010) For this study, the terms mastery goal and performance goal will be
used. At this time, these two labels are most widely used in the literature. (Horowitz, 2010; Hulleman et al, 2010)

Recent work has established a distinction between approach and avoidance goals. (Baranik, Stanley, Bynum, & Lance, 2010; Elliot & McGregor, 2001; Hidi & Harackiewicz, 2000; Hulleman et al, 2010) This 2x2 framework was developed to help better explain inconsistent findings linking achievement goals to academic outcomes. A 2x2 goal framework describes dimensions of competence beliefs, mastery or performance goals, as well as an approach or avoidance valence. (Baranik, Stanley, et al, 2010; Elliot & McGregor, 2001) Goal definitions are based on students’ perception of either the process or the product as being more valuable; valence describes either a positive or a negative sense of efficacy for attaining that goal. The following table (Table 2.1) summarizes the 2x2 goal orientation framework as it is understood in the current literature. Each of the four possible goal orientations is described in more detail below.
Table 2.1: Summary of 2x2 Goal Framework

<table>
<thead>
<tr>
<th>Valence</th>
<th>Approach</th>
<th>Mastery</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Focus:</td>
<td>engagement in learning process, personal understanding, increased personal knowledge, mastery of content</td>
<td>Focus: demonstration of knowledge and ability to others, active comparison against peers to indicate learning; engagement in learning for end product</td>
</tr>
<tr>
<td></td>
<td>Source: Internal</td>
<td></td>
<td>Source: External</td>
</tr>
<tr>
<td></td>
<td>Behaviors:</td>
<td>active engagement; strategy use, (generally associated with deep level processing strategies for transformation of information)</td>
<td>Behaviors: active engagement; strategy use; social comparison</td>
</tr>
<tr>
<td></td>
<td>Outcomes:</td>
<td>positive academic outcomes in learning situations; higher retention of information</td>
<td>Outcomes: positive academic outcomes in competitive situations; higher scores on post-reading tests;</td>
</tr>
<tr>
<td></td>
<td>Focus:</td>
<td>avoidance of knowledge loss (forgetting previously acquired knowledge), fear of not being able to complete a task or of misunderstanding content;</td>
<td>Focus: avoiding engagement in academic activities; avoidance of social comparison of knowledge against standards or peers; fear of appearing less capable than others</td>
</tr>
<tr>
<td></td>
<td>Source: Internal</td>
<td></td>
<td>Source: External</td>
</tr>
<tr>
<td></td>
<td>Behaviors:</td>
<td>task engagement; avoidance of self-reference; disorganized strategy use</td>
<td>Behaviors: work avoidance, lack of engagement or strategy use</td>
</tr>
<tr>
<td></td>
<td>Outcomes:</td>
<td>mixed academic outcomes</td>
<td>Outcomes: negative academic outcomes</td>
</tr>
</tbody>
</table>


**Approach Goals.** When a person is actively engaged in a task and working towards a display of competence she can be said to have an *approach* goal; her behaviors might include setting a purpose, expending effort, and monitoring her
progress towards achieving that task. Both mastery- and performance-approach goals are related to positive achievement outcomes. Approach goals are those which stem from a belief that a positive outcome is likely to occur. (Baranik, Stanley, Bynum, & Lance, 2010; Elliot & McGregor, 2001) As the name suggests, students with an approach belief will actively engage in tasks in order to experience that positive outcome. In general, an approach orientation predicts academic success; it is typically linked to strong self-regulatory behaviors for learning, such as competent strategy use and persistence on challenging tasks. (Elliot, & McGregor, 2001; Hidi & Harackiewicz, 2000; Hulleman, Schrager, Bodman, & Harackiewicz, 2010; Veerman & Tapola, 2004)

Mastery Approach Goals. Mastery approach goals are those that can be described as effortful, strategic engagement in a task leading to proficiency in a skill or subject. (Elliot, 2005; Elliot & McGregor, 2001; Kaplan, Middleton, Urdan, & Midgley, 2002) Students motivated by mastery approach goals are focused on personal understanding and competence, and seek to increase their own knowledge stores through effortful task involvement. These goals are generally associated with people who choose to engage with and persist in challenging tasks, employ strategic processing behaviors, and have positive self-efficacy for learning. (Ames, 1992; Bong, 2009; Dweck & Leggett, 1988; Entwistle & Ramsden, 1982; Kaplan, Middleton, Urdan, & Midgley, 2002; Negru & Damian,
Students who believe that effortful engagement is a necessary part of learning will endorse mastery goals more readily and be willing to expend effort reaching their goals because they believe that effort can lead to improvements in competence. (Dweck & Leggett, 1988; Elliot, 1999; Linnenbrink & Pintrich, 2002; Nicholls, 1984; Nolen, 1988; Weiner, 2000)

Mastery goals are closely related to students’ interest in the topic at hand, and their feelings of engagement in the classroom. The more interested in the topic, the more likely students are to engage in learning about it for personal understanding, including using more sophisticated strategies. (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Pintrich & DeGroot, 1990) However, mastery goals should not be confused with interest; they are not the same thing. Academic interest is about the value of information to the learner, or about enjoyment gained from learning new things. Mastery goals, while having aspects of interest to them, are about academic competence. (Senko & Harackiewicz, 2005)

Mastery approach goals have continually been shown to be positively related to learning outcomes. (Elliot, & McGregor, 2001; Linnenbrink, 2005; Meece & Miller, 2001; Middleton, Kaplan & Ryan, 2001; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Schunk, Pintrich, & Meece, 2008) Students who adopt mastery approach goals tend to use more adaptive cognitive strategies, to exhibit greater
persistence on challenging tasks, and to retain information over long periods of time. (Bartels, 2010) Studies have repeatedly shown that students who adopt a mastery orientation do better on reading tasks than students who adopt a performance orientation. (He, 2008)

Mastery approach goals are positively related to strategy use and outcomes for writing as well as reading. He (2005) manipulated the goal orientation of a writing task by giving instructions that focused students to think either about their performance relative to others or their performance relative to their personal goals. Literacy outcomes were measured on two levels; first, by the amount of strategies the writers reported using during the task, and second, on an independent assessment of their writing. Students who were given the mastery-oriented directions were found to use more writing strategies, to use those strategies more flexibly, and to have their writing scored more highly than students who were given performance-oriented directions.

Performance Approach Goals. A performance approach orientation can also be understood as being a positive stance for learning, although with a different relationship to achievement than a mastery approach goal would have. (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Hidi & Harackiewicz, 2000; Horowitz, 2010; Linnenbrink & Pintrich, 2002; Schunk & Zimmerman, 1997) Students who are performance oriented will actively engage in academic
tasks, and will engage strategies and apply effort in the pursuit of their goals. (Baranik, Barron et al, 2010) What differs between performance and mastery goal stances is the underlying belief about the purpose of learning. Performance oriented students tend to see learning as a means to an end, rather than the end itself—gaining personal understanding is not the ultimate purpose; being able to demonstrate achievement compared to others is.

Performance goals, both approach and avoidance, come from a sense of competition with others, often defined as “social comparison.” (Baranik, Stanley, Bynum, & Lance, 2010; Elliot, 1999; Horowitz, 2010; Kaplan, Middleton, Urdan, & Midgley, 2002) Learners who are performance oriented are concerned with being correct, with doing better than others completing the same task, and with appearing competent in social situations in order to validate their own abilities. (Horowitz, 2010) In terms of an academic setting, this means getting a higher grade on a quiz or test, or answering more questions correctly in a classroom discussion than other students. These outcomes may be interpreted by the learner as a form of extrinsic reward (Horowitz, 2010) although there is no specific link between extrinsic motivation as defined by Self-Determination Theory and performance approach goals. (Sungur & Sengler, 2010) For this reason, performance goal benefits are considered to be situational, determined by
the learning context, the required skills, and even age of the student, in a way that mastery goals are not. (Kaplan, Middleton, Urdan, & Midgley, 2002)

One positive effect of performance goals is that they can increase self-efficacy when students are successful at demonstrating their knowledge. (Hidi & Harackiewicz, 2000; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002) For this reason, researchers are hesitant to say that performance goals are maladaptive across the board. Findings suggest that performance and mastery goals are generally associated with different behaviors. (Hidi & Harackiewicz, 2000, p161) and that these behaviors associated with performance goals are less adaptive or useful for long-term learning than the behaviors associated with learning goals. (Elliot, McGregor, & Gable, 1999; Middleton, Urdan, & Kaplan, 2002; Midgley, Kaplan & Middleton, 2001) For example, although conceptual understanding of material may occur, it is not necessarily obtained through deep-processing of ideas in relation to prior knowledge. Rather, performance oriented students tend to adopt surface-level strategies that are directed at verbatim recall of a text or facts contained therein. (Entwistle & Ramsden, 1982; Meece & Miller, 2001; Midgley, Kaplan, & Middleton, 2001)

Despite these possible benefits, performance goals’ positive effects on academic success seem to be highly context-bound. (Elliot, McGregor, & Gable, 1999; Midgley, Kaplan, & Middleton, 2001) The strategies associated with a
performance orientation can be adaptive in testing situations or highly competitive classrooms where verbatim recall is valued over reflection, but they do not consistently lead to positive academic outcomes. Although performance goals have been linked to high test scores and course grades for some students, mastery goals are still better predictors of interest and retention of information. (Baranik, Stanley, Bynum, & Lance, 2010; Young, 2007) Researchers have found them to have an unpredictable relationship with academic success and feelings of efficacy, possibly because they have been linked to feelings of anxiety in academic situations. (Baranik, Stanley, et al, 2010; Bong, 2009; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Kaplan, Middleton, Urdan, & Midgley, 2002) Recent studies suspect this ambiguity has to do with the age of participants; it has been suggested that performance approach goals are beneficial only to high school and college aged students, who typically experience more competitive learning environments. (Horowitz, 2010; Hulleman, Schrager, Bodman, & Harackiewicz, 2010; Shim et al, 2008; Wolters, 2004) Meta-analytic work by Hulleman et al (2010) has also suggested that part of the difficulty in establishing the relationship between performance goals and academic outcomes stems from inconsistent theoretical conceptions of the performance orientation in the literature.
Avoidance Goals. It was originally because of this inconsistent relationship between performance goals and academic outcomes that a distinction between approach and avoidance goals was introduced in the literature. (Elliot, & McGregor, 2001; Hidi & Harackiewicz, 2000; Hulleman Schrager, Bodman, & Harackiewicz 2010; Veerman & Tapola, 2004) Avoidance orientations explain the circumstances in which goals are not related to academic success. (Elliot, 1999; Elliot & McGregor, 2001; Gottfried, 1990; Hidi & Harackiewicz, 2000; Kaplan, Middleton, Urdan, & Midgley, 2002; Nicholls, 1984; Turner et al 2002) Avoidance goals are adopted by students who wish to avoid negative academic situations, often by avoiding the learning task altogether, due to anxiety about or fear of failure. (Baranik, Stanley et al, 2010; Bartels, Magun-Jackson, & Ryan 2010) Avoidance goals are generally adopted in an effort to protect self-worth and to deflect attention from one’s ability which is assumed to be inadequate for the task at hand (Elliot & McGregor, 2001) and may be linked to some types of extrinsic motivation (Sungur & Sengler, 2010) Even in situations where students do engage in a task, they are unlikely to experience success as avoidance goals are linked to inconsistent or disorganized learning behaviors. (Baranik, Stanley et al, 2010)

Performance Avoidance Goals. Performance-avoidance goals were first conceptualized to explain the negative effects that performance goals were
sometimes shown to have on academic outcomes. (Elliot & McGregor, 2001) Like performance approach goals, performance avoidance goals stem from a sense of competition between peers. (Baranik, Stanley, Bynum, & Lance, 2010) Students who adopt this orientation do so out of fear of social comparison that will show them to be less able than their peers, or of normative evaluations that will highlight their academic weaknesses. (Bartels, Magun-Jackson, & Ryan 2010) Performance avoidance goals have a consistently negative relationship with academic outcomes. They have been linked to increased anxiety for academic tasks, and to a decrease in academic performance. (Baranik, Stanley et al, 2010; Elliot, 1999)

*Mastery Avoidance Goals.* The concept of a mastery-avoidance goal is somewhat unclear even in the most current literature, and there exists some debate about its conceptualization. (Baranik, Stanley, Bynum, & Lance, 2010) A mastery-avoidance goal is generally endorsed by students who are concerned that their skills or knowledge have stagnated; they experience anxiety about self-referent learning situations in which they may find they have misunderstood or forgotten important information or may be unable to complete an assigned task. (Baranik, Stanley et al, 2010; Elliot & McGregor, 2001) This goal orientation is considered to be one of mastery because it, like a mastery approach orientation, begins with interest in a topic and a desire for personal achievement. However,
the positive benefits are often outweighed by anxiety and lack of confidence. Mastery avoidance goals are linked to disorganized studying behaviors and strategy use, which tends to undermine their relationship to academic success. (Baranik, Stanley et al, 2010; Elliot & McGregor, 2001) In some situations, the academic outcomes from students who adopt a mastery avoidance goal can be as negative as that of students who adopt a performance avoidance goal. Yet, in other situations students' interest provides some level of success. Some research on mastery avoidance goals does indicate that they are likely adopted by students with non-optimal dispositional motivation in optimally motivating classroom environments; as a result, when success is experienced, students can develop an approach orientation. (Baranik, Stanley et al, 2010; Elliot & McGregor, 2001)

Multiple Goal Orientations

It was originally believed that an individual possessed either a mastery or a performance goal. Now, research is showing that an individual can have multiple, sometimes conflicting, goals for tasks. (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Hart & Albarracin, 2009 Hidi & Harackiewicz, 2000; Hulleman Schrager, Bodman, & Harackiewicz, 2010; Linnenbrink, 2005; Kaplan, Middleton, Urdan, & Midgley, 2002; Midgley, Kaplan, & Middleton, 2001; Wolters, 2004) This can be challenging when the student is unable to regulate her
learning behaviors to accomplish each goal. At the same time, there may be benefits to having multiple goal orientations. (Darnon, Dompnier, Gillieron, & Butera, 2010; Kaplan, Middleton, Urdan, & Midgley, 2002; Pintrich, 2000) Barron and Harackiewicz (2000) proposed four possible goal patterns that would account for the benefits of the multiple goal perspective: additive, specialized, selective, and interactive. (Darnon et al, 2010) Depending on the way in which a mastery-approach and performance-approach goal work together students can experience different benefits. Multiple goals may allow students to focus on both the means and the end in a learning situation, and to choose strategies that are appropriate to the purpose of the task. (Hart & Albarracin, 2009) They may also allow students to switch goals within a task as expectations change; for example, using mastery goals to promote interest and develop competence, then endorsing a performance goal to demonstrate achievement. (Zimmerman & Kitsanas, 1997) Other research suggests that being able to work towards a personal mastery goal while still being able to direct strategic energy to success on a classroom-imposed performance task would allow a student to experience the best possible outcome for both orientations. (Hulleman et al, 2010) Each of these perspectives seems to indicate that learning is optimal when both goals are strongly held.
A multiple goal orientation may be particularly common in younger learners. In general, elementary school students have been shown to endorse both a performance- and a mastery-approach goal simultaneously more readily than their older peers. (Sungur & Sengler, 2010) The relative strength of either goal will be determined by the learning situation and the individual students’ responses to it. Achievement goals operate at two levels in a learning situation. Each student will adopt his or her own individual achievement goal. At the same time, the classroom environment emphasizes a particular goal structure for learning tasks.

**Individual Goals**

It is important to understand why students choose the goal or goals that they do. Goal choice has little to do with students’ actual ability, but is instead a product of what students believe about their ability and about the purpose of learning. (Dweck, 1986) A student’s goal orientation is determined by a number of factors, including self-efficacy for the task, and classroom context. For example, students who believe intelligence is a fixed entity and hold transmission beliefs are more likely to endorse performance goals, while mastery goals are more typical of students see intelligence as a malleable trait, and understand knowledge to be transactional and based on effortful engagement. (Dweck & Leggett, 1988; Kaplan, Middleton, Urdan, & Midgley, 2002; Schraw &
Bruning, 1999) These beliefs are also closely related to students' use of strategies for learning. Students who believe in the malleability of their own intelligence are more likely to use reading strategies and expend effort to ensure comprehension.

**Goal Structures**

The instructional practices of a classroom also indicate an emphasis on a particular goal orientation, referred to as the goal structure of the learning environment. (Ames, 1992; Kaplan, Middleton, Urdan, & Midgley, 2002; Wolters, 2004) The classroom environment can have a profound impact on students; their personal goals may be subjective responses to the environment based on their perception. (Kaplan, Middleton, Urdan, & Midgley, 2002; Meece, Blumenfeld, & Hoyle, 1988; Negru & Damian, 2010) Classrooms that focus on grades, in which students are expected to complete tasks in a scripted manner, assess students compared to others, and provide feedback in public forums are more likely to have students who have adopted a performance goal orientation. (Ames, 1992; Elliot, 1999; Patrick, Ryan, & Kaplan, 2007) Classrooms where students are held responsible for their own learning are asked to demonstrate knowledge in authentic ways, and where the teacher encourages students to use personal means for learning are typically considered mastery goal oriented environments. (Ames, 1992; Patrick et al, 2007) In general, mastery oriented
classrooms place more emphasis on personal knowledge making, individual progress, and employ methods of assessment and instruction such as cooperative group learning and informal class discussion. (Ames, 1992; Meece & Miller, 2001; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001)

Just as important as supporting a mastery goal, classrooms can also help students to adopt an approach valence for learning tasks. Classrooms that promote autonomy for students and in which instruction focuses on interesting, engaging activities have been shown to support students' competence beliefs, intrinsic motivation for learning, and adoption of approach goals. (Ryan & Deci, 2000; Sungur & Sengler, 2010) Some researchers have argued that the tasks themselves, rather than the directions or messages from the teacher about those tasks, are what most strongly predict students' motivation, persistence, and strategy use. (Turner, 1995) For this reason, educators have increasingly tried to develop learning tasks that promote optimal motivational beliefs in an effort to support student success. These instructional strategies will be discussed in more detail.

Situational and Dispositional Achievement Goals

Students choose goals based on both their disposition towards academic work, and the situation in which they find themselves. Dispositional motivation is created over time, and is influenced by the classroom, cultural, and home
environments. Situational motivation, on the other hand, is particular to the learning context; it is constructed by the learner and is often unstable. (Baranik, Barron, & Finney, 2010; Linnenbrink & Pintrich, 2002; Paris & Turner, 1994) The two forms of motivation do not function independently; a student’s dispositional motivation will influence how she interprets a learning environments and specifies her goals for tasks in that environment. (Tapola & Niemiurta, 2008) For example, dispositional motivation may determine whether a student adopts an approach or an avoidance stance, while situational motivation determines whether the learning goal is mastery or performance oriented. (Bartels, Magun-Jackson, & Ryan, 2010) Situated motivation, because it is bound by the context, is what informs a student’s choice of learning strategies and helps to promote self-regulated learning. (Paris & Turner, 1994)

Within the literature on achievement goals and academic outcomes, researchers have looked increasingly at situational motivation, such as goals and outcomes within a single school year or college course. (Baranik, Barron, & Finney, 2010; Fryer & Elliot, 2007) This is because researchers find AGT to be most utile and valid when applied to specific learning domains. (Baranik, Barron et al, 2010) In general situational motivation is also of more interest to AGT researchers because situational goals are less stable than dispositional ones. The conditions under which achievement goals can and do change is of particular
interest to both researchers and teachers hoping to help students to develop
more adaptive goal orientations.

**Stability and Change in Achievement Goals**

Research on the classroom’s impact on goal orientation, and students’
resulting learning behaviors, has often focused on periods of change in goals.
Although some research suggests that achievement goal orientation is domain-
general and “somewhat stable” across various learning contexts (Young, 2007, p
237), many researchers have shown that goals are susceptible to change during
periods of transition, such as between elementary, middle and high school
(Ames, 1992; Legault, Green-Demers, & Pelletier, 2006; Marchand & Skinner,
2007; Schunk, Pintrich, & Meece, 2008) or over smaller periods of time such as
the course of a college semester. (Elliot & Church, 1997; Fryer & Elliot, 2007;
Senko & Harackiewicz, 2005)

The shift between grade levels is often used for the setting of research on
achievement goals because of several changes that take place. For example, as
students move from elementary to middle school, there is an increase in
competition between students, and an increasing sense that being *right* is
essential. (Rogoff, 2003) These are in addition to changes in the physical
environment; students are often in a new building and must move between
multiple classrooms and teachers. All of these changes can be linked to a decline
in motivation for academic tasks as students transition into middle school. (Marchand & Skinner, 2007; Negru & Damian, 2010; Schunk, Pintrich, & Meece, 2008; Shim, Ryan, & Anderson, 2008) Young children tend to understand intelligence and achievement as related to effort; as long as you try hard, you can do anything. Beginning around adolescence, an entity understanding of intelligence develops wherein students believe that achievement is related to being smart, and that being smart is just something that you “are.” (Schunk, Pintrich, & Meece, 2008; Stipek & Gralinski, 1996) Effort is actually seen as antithetical to intelligence because being smart means not having to try for success. An increasing emphasis on test scores and performance is also related to higher anxiety for middle school students and less willingness to accept mistakes as part of the learning process. (Schunk, Pintrich, & Meece, 2008) Students who experience a decline in self-efficacy and feel an increasing need to exhibit greater intelligence relative to peers tend to struggle with tasks that require metacognitive strategy use. (Guthrie, Wigfield, Metsala, & Cox, 1999; Marchand & Skinner, 2007; Zimmerman, 1995, 1998)

The findings from research on change across college semesters also show evidence of changing achievement goals in response to the environment. In general, it was determined that students’ mastery orientation declines over the course of the semester. (Fryer & Elliot, 1997; Jagacinski, Schrager, Bodman, &
Harackiewicz, 2010; Senko & Harackiewicz, 2005) In both studies, students were assessed multiple times throughout the semester, and their achievement goals were measured before each quiz or test. Changes were subtle in both studies, and varied depending on the goal endorsed. At the classroom level, goals did not change significantly across the semester, which was expected since the environment was fairly stable. At the individual level more change was evident. In general, mastery-approach and performance-avoidance goals were most susceptible to change, and these changes were more significant early in the semester. (Fryer & Elliot, 1997; Senko & Harackiewicz, 2005) Shifts were attributed to students' increasing knowledge of the course; as they became familiar with the content and with the tasks associated with the course, these students were adjusting their goal orientation according to their own competence perceptions.

All of these studies show that achievement goals are not necessarily stable constructs. Instead, they are subject to students' perceptions of the learning environment and their own competence. In past research, domains of inquiry have ranged from several school years to a single college course. Within these broad contexts, there has been evidence for instability in students' achievement goals based on their changing perceptions of the learning environment and their own competence. (Fryer & Elliot, 1997; Jagacinski, Schrager, Bodman, &
Harackiewicz, 2010; Senko & Harackiewicz, 2005) However, research should also consider far more specific contexts to understand changes that may take place in students’ goal orientations even in very limited amounts of time. A specific context that may yield new and interesting data about achievement goals is a learning project in an elementary classroom. Such a domain requires an achievement goal to exist, possibly a different goal for each task involved. As there are usually multiple tasks in a project, it can be argued that within a single project, there are points of transition during which goals may be subject to change. Such projects are used in schools specifically for the purpose of increasing students’ mastery approach motivation. Given this goal, it seems plausible that within a single project students’ goal orientations may undergo subtle changes.

Reading may be a particularly interesting domain for examining transitions and goal stability. In a broad sense, reading is a developmental process with periods of transition identified by various researchers. (Chall, 1983; Wolf, 2003) However, the conceptualization of transitions in reading can also be much narrower. Within a single reading event, three stages have been identified: before reading begins, during reading, and after reading. (Reutzel & Cooter, 2008; Tompkins, 2006) Each stage can be considered as a unique phase in the reading process, which implies a transition between those phases. This suggests
that achievement goals could be unstable during these periods of transition as students move from one reading phase to the next, just as they are unstable during transitions between the stages of reading development.

Research has uncovered the influence that environment and situation can have over achievement goals. It seems a logical next step for research is to refine the idea of "situation" to a specific task, and to measure goals and self-efficacy as related to that task. It would be more informative to have students complete surveys detailing their reading motivation at the time of reading, and pertaining specifically to the reading task they are completing. This may be especially true when working with younger readers who are often disadvantaged by questions too far removed from a tangible event.

**Research Question One**

*Is there stability in student motivation within and between tasks in a learning project?*

**What Do I Need To Do To Succeed?**

**Strategy Use for Academic Success**

Successful reading should lead to meaningful use of what has been learned, not simply recall of information; comprehension involves the active creation of a coherent interpretation of the text in the reader’s own words. (Guthrie & Wigfield, 1999a; Guthrie, Wigfield, Metsala, & Cox 1999b; McNamara, Kintsch,
From this perspective, reading cannot be a passive process wherein information is simply transmitted to the reader from the text, but must be an engaged transaction between reader and text that requires the careful use and monitoring of comprehension strategies. (Dweck & Leggett, 1998) Reading comprehension strategies are active, deliberate cognitive behaviors that students use to support understanding and learning from a text. (Cantell & Carter, 2009) Successful reading consists of two simultaneous processes: extracting information from the text, and constructing knowledge by connecting that information to an existing schema. (Davis & Neitzel, 2010; McKeown, Beck, & Blake, 2009) These processes are accomplished through the use of cognitive strategies. Strategies require some level of metacognitive awareness as well; it is not enough only to know what to do, optimal learning comes from also knowing when and why to use strategies. (Dermitzaki, Andreus, & Paraskeva, 2008; Frey & Fisher, 2007)

The use of strategies involves intent, and whether or not a student will choose to use strategies during learning is closely related to achievement goal orientation. (Pressley & Levin, 1983; Schraw, Horn, Thorndike-Christ, & Bruning, 1995) Students with an approach orientation are more likely to use strategies to support learning because they are invested in expending the effort necessary for learning. In general, it is believed that a mastery approach
orientation has the most positive relationship with strategy use since it seems to be predictive of deep-processing strategy use and retention of information. Strategies may also be related to the outcome standards that students hold for a particular task. Students’ beliefs about their likely outcomes, and the control they have over those outcomes, will influence the way in which they engage in an academic task. (Cantrell & Carter, 2009)

**Self-Regulated Learning**

Students who effectively use strategies to support their own learning are often described as being *self-regulated* learners. (Clearly & Zimmerman, 2004) “Self-regulation involves learners who proactively direct their behavior or strategies to achieve self-set goals.” (Cleary & Zimmerman, 2004, p538) Self-regulated learning (SRL) describes learning as a cycle with three distinct stages: planning before the task, strategic engagement in the task, and reflection on one’s effort and learning after the task. Self-regulated learning is based on the concepts of *volition* and volitional control—both central elements in the earliest theories of motivation. Volition refers to a cognitive stance that helps a learner to direct behaviors towards task completion; specifically it is a person’s ability to either express or suppress behaviors in order to complete a task. (Corno & Randi, 1997) Volition is what helps students to choose, implement, and monitor strategies as they engage in learning-directed activities.
Self-regulated learning has been specifically studied in relation to academic
learning tasks, such as reading, because these tasks tend to be challenging and
require good behavior control. Self-regulated learners engage in activities such as
reading out of sense of personal interest in constructing knowledge, and get
satisfaction from being active in their own learning. (Ablard & Lipschultz, 1998)
Michael Pressley (1995) has explicitly argued for the idea that reading is itself a
form of self-regulated learning. Reading requires careful coordination of
strategies to support comprehension and learning, and managing these strategies
requires strong volitional control. (Corno & Randi, 1997; Turner, 1995; Wigfield
& Guthrie, 1997) Self-regulated learning has three phases: planning, action, and
evaluation. (Dermitzaki, Andreou, & Paraskeva, 2008) Before reading, the self-
regulated learner begins by setting a goal in order to establish a purpose for
reading. During reading, she actively uses strategies based on her goal to
understand the text. After reading, the self-regulated reader reflects on her
strategy use for the task she has just completed. She decides if her actions helped
her achieve the intended goal, and makes plans for strategy use on future tasks.
She must assess whether or not the reading goal has been met, and hopefully
receive feedback from another source. A possible source of feedback is the use of
acquired information on a meaningful task. So long as the reader feels that the
task is an appropriate measure of learning, she will be able to use it as a form of reflection on her own learning.

The focal point of self-regulated reading is the use of strategies to support comprehension of the text. Depending on whether the text is narrative or expository, students will use slightly different strategies. When reading from an expository text, which is often the case in upper elementary grades and beyond, students use strategies that are aimed at extracting, connecting, and constructing knowledge. (Davis & Neitzel, 2010; Keene, 2010)

**Reading Comprehension Strategies**

There are many strategies available to readers. Much of what researchers and educators know what about strategy use is based on verbal reports of competent readers. (Hilden & Pressley, 2007) These reports have uncovered a small subset of strategies that are commonly reported by good readers: *setting a purpose/making predictions, activating prior knowledge, asking questions of the text and then finding the answers, periodically summarizing, creating mental images, seeking clarification as necessary, and drawing inferences.* (Brown, 2002; Cantrell & Carter, 2009; Davis & Neitzel, 2010; Dymock & Nicholson, 2010; Frey & Fisher, 2007; Hilden & Pressley, 2007; Keene, 2008; Keene & Zimmerman, 1997; Pressley, 2001, 2002, 2004; McKeown, Beck, & Blake, 2009; Trabasso & Bouchard, 2002) These strategies are repeatedly touted as having a positive relationship with reading
engagement and a positive effect on reading achievement. Each supports learning in a unique way. Good readers begin using these strategies before they open a book, and continue to use them beyond the last written word.

Strategies have been described in two levels: surface and deep-processing. (Cantrell & Carter, 2009; Entwistle & Ramsden, 1982) Some readers get only as far as the surface-level because they use strategies that are aimed at understanding only the explicit information from the text. Surface level processing strategies include behaviors like rereading for memorization, rehearsal of the text, skipping over unfamiliar words, and verbatim note taking. Surface level strategies are a necessary start to extracting information from text, but they are not enough to fully develop and construct knowledge. For readers to develop a fuller understanding of the text, including both the explicit and implicit information contained therein, they must also use deep processing strategies. Deep-processing strategies, sometimes called encoding strategies, are those that help readers to make meaningful representations of information and connections between their own prior knowledge and the text, to understand the author’s argument or point of view, and to understand the overall meaning or message of the text. (Cantrell & Carter, 2009; Entwistle & Ramsden, 1982; Pressley & Levin, 1983; Turner, 1995) In general deep-processing strategies lead
to better retention of information over time, more flexible usage of information, and a better ability to apply information in novel situations.

Some researchers have categorized strategies according to the purpose that a reader might have for employing them. For example, Mohkatari & Reichard (2002) identified three functional categories of strategies: global analysis, problem solving, and support strategies. (Cantrell & Carter, 2009) Global analysis strategies are intended for overall meaning making from a text; problem solving strategies help to repair misunderstanding; and support strategies are actions such as note taking that provide additional, referential experiences with the ideas from the text.

Whatever the label for a strategy, its function is to help support comprehension from text. Self-regulated readers employ strategies in a cyclical fashion, beginning with planning what strategies to use based on their task goals. During reading, self-regulated learners actively employ strategies as needed, based on their plans and goal. Finally, self-regulated readers routinely evaluate their strategy use including making on-line adjustments and reflecting on their goal attainment once they have reached the end of the text. The first thing that good readers do is to set a purpose for reading, often in the form of a prediction or expectation about what they will learn from the text. (Keene & Zimmerman, 1997; Pressley, 2002; Tompkins, 2006) This purpose will give the reader a clear
goal for the task, and will help her to decide on what strategies to use. During reading, the purpose will serve as a checkpoint for monitoring comprehension. It will help the reader to determine what information is important, and what details are interesting but non-essential to comprehension. Finally, at the end of the text, the reader can check what she has accomplished against her original thoughts to determine whether or not she has met her goal. One way in which good readers conceptualize their predictions is by developing guiding questions that they want to answer. Questions play a vital role in reading comprehension as long as they focus on the why, and how of the text; questions that ask what, who, or when are less likely to force readers to explore the text beyond its most obvious message. (Brown, 2002; Taboada, Tonks, Wigfield, & Guthrie, 2009; Taraban, Rynearson, & Kerr, 2000)

Another strategy that good readers employ is accessing their prior knowledge of the topic. Prior knowledge is especially important in constructing knowledge; once information has been extracted from the text, it is joined to preexisting knowledge, as has been described in Kintsch’s construction-integration model. (McKeown, Beck, & Blake, 2009) Two types of prior knowledge can be helpful to readers. The first is about the form of the text. Different genres or types of texts have different formats; knowledge of the text format can help guide a reader’s purpose and strategy choice. The other type of prior knowledge that good
readers access is their content knowledge. The more that a student knows about the topic of the text, the better comprehension she will have. The use of appropriate prior knowledge has been repeatedly shown to improve students’ reading comprehension. (Alvermann, Smith, & Readence, 1985; McKeown, Beck, Sinatra, & Loxterman, 1992; Pressley, 2004; Taraban, Rynearson, & Kerr, 2000) Prior knowledge is generally activated at the beginning of the reading cycle, but a good reader is constantly coming back to review, reinforce, and revise it.

As good readers go along in a text, they are constantly monitoring their own comprehension, assessing how well they understand the concepts in the text. When there is a breakdown, many readers go back and reread the confusing section, giving them a chance to apply multiple strategies to a small area, which can increase comprehension and retention. (Baker, 2002) Stopping to summarize chunks of text, putting information in their own words, is one way that good readers monitor their comprehension. Summarizing helps a reader to compile what she has learned and to determine what still needs to be explained.

Although it is often difficult to teach and to observe, good readers create mental images and make inferences as they are reading. Inferences are implicit connections drawn from putting parts of the text together with: other parts of the text (text-to-text), personal knowledge or experience (text-to-self), or world knowledge (text-to-world). (Cooper, 2006; Tompkins, 2006) Authors rarely say
everything—that would take too long. Instead, they rely on an assumption of shared knowledge that the reader can use to fill in the missing pieces. Good readers frequently report that they create mental images as they read, to support their comprehension and engagement. (Gambrell & Bales, 1986; Gambrell & Koskinen, 2002; Gambrell & Sawitz, 1993; Long, Winograd, & Bridge, 1989) Research has shown that readers who are able to create mental images which represent the ideas from the text have better comprehension and memory for the text. (Pressley, 2002)

Self-regulated readers actively evaluate their comprehension and strategy use during and after reading. They may go back and reread selections of the text that they felt were either important or unclear; they summarize what they have read in their own words (either mentally or in writing) which helps them to monitor their sense of understanding and to reflect on their learning behaviors; readers also make plans for their use of new information on future tasks. (Pressley, 2002) This after-reading period of reflection is essential to comprehension; it is just as important as the strategies used before and during reading. By monitoring comprehension and making future plans for the application of what they have learned, these readers are giving themselves an additional exposure to the concepts in the text. By reflecting on their learning behaviors, they are deciding whether or not the strategies they used were in fact the most appropriate and
determining if they could have put forth more effort in order to make their strategies more effective.

Many good readers, when interacting with informational texts, choose to take notes. The use of notes brings writing into the reading act, which itself is an important comprehension strategy. Like any strategy, writing notes can be either a surface level process or a deep-processing strategy. Students who simply copy verbatim statements from the text are not processing the information in the same way as are students who put what they have read into their own words. (Frey & Fisher, 2007; Novak & Gowin, 1984; Tompkins, 2006) On the other hand, students who use a graphic organizer are making visual representations of the connections between concepts from the text in a way that compliments and allows revision of their prior knowledge. (Altemeier, Jones, Abbott, & Berninger, 2006; Novak & Gowin, 1984; Peverly et al, 2007; Slotte & Lonka, 1999) This allows them to construct, rather than simply absorb, information from the text in a way that is personally meaningful. Notes serve two functions for a learner: they are both a process and a product of learning. (Frey & Fisher, 2007) The note-making process is an opportunity for transformation which results in a product that can be returned to for enhanced understanding. (Novak & Gowin, 1984) Students who are adept at note taking generally do better tests and essays than their less proficient peers. (Frey & Fisher, 2007)
The use of strategies is not universal, nor is it automatic to many readers. Some readers do not employ strategies at all, even though they possess the procedural knowledge to do so. For self-regulated learners and students involved in project based learning, one major factor influencing their choice to use reading strategies is their motivation for learning. Some readers are intrinsically motivated; they read because they enjoy the act of doing so, and enjoy the rewards they get from reading, such as new, interesting knowledge. (Wigfield, 1997) On the other hand, some readers are extrinsically motivated for reading. These students read for recognition or grades from the teacher, or perhaps out of a sense of competition with their peers. (Wigfield, 1997) Whatever the impetus behind a reader’s motivation, it plays an important role in the quality and quantity of the academic reading she will do.

In reading, mastery goals are linked to the increased use of deep-processing strategies such as relating new information to prior or background knowledge, making inferences from the text, developing and asking questions from the text, identifying important information, and using notes that summarize the essential elements and inferences from a text. (Entwistle & Ramsden, 1982; Wolters, 2004) These sorts of strategies and behaviors are ultimately linked to a greater understanding of the text, better recall after an extended period of time, and more flexible use of knowledge built from the text. (Ames, 1992; Hidi &
Students' willingness to expend effort stems from their beliefs about the relationship intelligence has to ability, and is particularly influential on their use of strategies. In some cases, effort is seen as the opposite of ability: if one has to expend effort to complete a task, it is because she does not possess natural ability. Ability is seen as something innate, not something you create over time. These readers are less likely to use deep-processing strategies. Conversely, students who believe that effort is necessary for increasing understanding will be more willing to use strategies in order to increase their academic ability.

**Instructional Practices for Increasing Motivation and Learning**

In general, a mastery-approach orientation to learning has been considered the most beneficial for students, particularly at the elementary school level, although this is still open to debate based on research showing that a performance-approach orientation can also be beneficial, generally for high school and college students. For this reason, elementary classroom teachers have been encouraged to support learning by creating situations that promote a mastery-approach goal in all students. Several specific programs and instructional methods have been developed; each incorporates a number of
similar elements in the effort to promote a focus on the process of learning and the growth of personal understanding.

Using what is known about academic motivation, many researchers have come up with project-based programs that emphasize goals and self-efficacy to improve students’ learning behaviors and outcomes. Project-Based Learning (PBL) is a style of instruction that uses challenging problems and collaboration to improve students’ motivation for learning, task engagement, self-efficacy, and strategy use. (Frank & Barzilai, 2004; Meyer, Turner, & Spencer, 1997) During PBL, students are encouraged to investigate a meaningful course of inquiry. Most studies incorporate a mix of reading, writing, and even mathematics, and culminate in the creation of an artifact that represents what the student has learned. (Bell, 2010; Blumenfeld et al, 1991; Meyer, Turner, & Spencer, 1997) Concept Oriented Reading Instruction (CORI) is another such program. CORI, by definition, is aimed at improving students’ use of reading comprehension strategies by improving their motivation to engage in classroom activities that have literacy components. (Guthrie, Wigfield, & Von Secker, 2000) CORI joins achievement goals, along with other motivational constructs, and explicit strategy instruction in an instructional framework designed to increase students’ reading comprehension and achievement. (Guthrie et al, 2004; Guthrie, Wigfield, VonSecker, 2000; Swan, 2004) Classrooms implementing the CORI program
have recorded significant gains in student academic motivation and achievement, including increased use of deep-processing strategies during reading. (Guthrie et al., 1998) Similar results have been found for comparable programs in other countries. (Aarnoutse & Schellings, 2003; Shaaban, 2006)

**Common Themes in Project Oriented Learning.** Allington (2002) specifically mentions the use of long-term learning projects as one of the hallmarks of highly effective classrooms. Whether it is a specific program or a lesson developed by a classroom teacher, learning projects share a number of common practices. The purpose of these is to enhance students’ situational motivation. This is done by raising students’ interest in the topic which in turn enhances students’ use of learning strategies and adoption of approach goals. (Bell, 2010; Harackiewicz, 2008; Hart & Albarracin, 2009; Hidi & Harackiewicz, 2000) A variety of instructional practices help to raise interest and promote learning. The common idea is that students work to answer an authentic question. The question may be asked by either the teacher or the students themselves, so long as it has some meaning to the students. (Bell, 2010; Blumenfeld et al, 1991) Students then complete a mixture of group and individual work in pursuit of their answer. This provides a sense of social collaboration, which has been shown to increase motivation in many students. (Deci & Ryan, 2004) Students also gain a sense of autonomy from project-oriented learning; they are responsible for their own
learning in as much as they decide how to go about solving the given problem, which raises their interest and sense of control. (Stefanou, Perencevich, DiCinto, & Turner, 2004; Turner, 1997) Although there may be interim tasks, the main product of a learning project is an artifact, created by the students, that demonstrates what the group has learned. Ideally, this artifact will demonstrate not just what the students have learned but also how they have learned it. (Bell, 2010; Blumenfeld, 1991; Meyer, Turner, & Spencer, 1997)

Within a learning project, there are typically multiple, related tasks that move the students closer to answering their guiding questions. (Bell, 2010; Blumenfeld et al, 1991) These tasks usually incorporate a number of disciplines and skill-sets. This promotes inter-domain thinking and, if the groups have been well formed, provides each member a chance to be the expert. Projects almost always include a reading task. One of the common goals of PBL, CORI, and other such programs is to develop students’ reading comprehension skills through strategy instruction. The use of reading strategies is essential to literacy success, and therefore has become a priority in instruction aimed at improving academic outcomes.

What educators and researchers know is that increasing mastery goals and self-efficacy can also increase students’ learning behaviors and self-regulation. This has been shown to be especially effective when done through project-based
learning. Typically, learning projects are not performance oriented; they do not include quizzes or tests to externally assess students' learning. However, there is no research determining if the inclusion of performance oriented measure would undermine the strategy use typical of students.

**Research Question Two**

*Is students' use of reading strategies affected when a performance oriented task is introduced into a mastery oriented learning project?*

**How Will I Know That I Have Been Successful?**

**Goal Outcomes**

In order to accurately assess whether one has reached a chosen goal, there must be a point of termination for an activity, and a criteria or expectation for what will have been accomplished at that end. (Latham & Brown, 2006) How students determine and interpret their outcomes is generally addressed by Expectancy-Value Theory (Wigfield & Eccles, 2000) and Attribution Theory. (Werner, 2000) However, understanding the criteria that learners use to judge their achievement or competence may be the essential piece to understanding the link between their achievement goals and their learning behaviors. (Hidi & Harackiewicz, 2000; Meece, Anderman, & Anderman, 2006; Nicholls, 1984) Often, the outcome is assumed by the goal orientation expressed by the learner, but some researchers have argued that goal and outcomes should be understand
as interrelated but separate constructs. (Hulleman Schrager, Bodman, & Harackiewicz, 2010) Outcomes can be understood as the student’s conceptualization of what will indicate goal attainment in a specific situation. Understanding the student’s perspective may offer important insight into the behaviors that she chooses to employ during learning.

To date, there is very little data on students’ understandings of what will signal they have attained their goals, particularly mastery approach goals. While performance goals may be easy for students to define because they necessarily include an external point of reference, mastery approach goals may be more difficult for students to assess. This may be particularly problematic in educational settings that emphasize personal reflection and self-monitoring, such as is expected of self-regulated learners. In order to regulate a process such as learning, a student needs to be able to accurately reflect on it, which may be particularly challenging if an end point is unclear or too distant to be useful. Therefore, this project will take initial steps to investigate students’ understandings of the tangible outcomes of their achievement goals.

**Research Question Three**

*Do students’ goal outcome standards relate to their motivation and reading strategy use?*
Summary

This section has outlined the basic tenets of Achievement Goal Theory, and the four possible goal orientations that students may adopt in a given learning situation. Research has shown that a mastery approach goal will most often benefit students in learning situations focused on personal understanding, such as those found in elementary school classrooms. A performance approach goal may be more adaptive to students in high school and college, where the demonstration of knowledge is valued. Approach goals in either form are more likely to support academic success than are avoidance goals, which are related to disorganized learning and negative outcomes. What goal and orientation a student chooses to adopt will be determined by a number of factors. To some degree, students’ goals are influenced by their dispositional academic motivation. Situational motivation, influenced by the classroom goal structure and students’ perceptions of their competence, will also help to determine what goal students’ adopt. Since achievement goals can be altered by the context and periods of transition, instructional practices aimed at influencing students’ motivation have become widely used in elementary school classrooms. The purpose of these practices is to promote mastery approach goals through learning contexts that emphasize interest and personal engagement through learning projects.
Even with this wealth of information, there is much that is still unknown about students' achievement goals. It has been established that achievement goals can change during periods of transition. It is also important to understand how goals and self-efficacy might shift within a small time frame, such as during the course of a learning project, or even within a reading event. Reading in particular has the potential for shifting goals as it is a three stage process, and there is no reason to believe that there are not salient transitions between the three stages. Although previous research has examined goal stability over time, it is possible that the transitions within and between tasks in learning projects provide instances of transition that give students the opportunity to monitor and adjust their achievement goals.

The measures used by researchers tend towards standardized tests, multiple choice questions, and oral retellings—all of which are inherently performance oriented as they have (or imply that there are) correct and incorrect answers. This is especially problematic as research also suggests that readers use different sets of strategies for mastery tasks than they do for performance tasks. Each of these methods has the perception of "testing" that can be imparted to students. Although it is most evident with the use of standardized measures—which epitomize the concept of a test to any student—any of these measures can be perceived as being about performance; each can give the reader a sense that there
are right and wrong answers. This perception shifts the reading act from one of learning from text to one of getting the right answer. Students set standards of success for themselves, based on what they perceive to be markers of success and failure in a specific situation. In a testing situation, even students who tend to be mastery oriented may set more concrete, right-versus-wrong standards for success, and measure their actions against those standards. This potentially means that during reading, these students are adopting a performance goal orientation, including the associated strategies. This study will address this potential issue by specifically measuring students’ achievement goals within different goal conditions (imposed through task directions), and then looking to see if these findings are related to differences in students’ strategy use.

Theories of learning, such as self-regulated learning, emphasize the need for self-reflection. In order to do this, students develop a standard for themselves on which to reflect after a learning event. A better understanding of how students’ conceptualize their outcome standards in relation to the achievement goals may offer additional, important insight for future research. Even with all that is currently known about self-efficacy, achievement goals, and strategy use, there are still inconsistencies in the literature. Perhaps by examining how students answer the question “How will I know that I have been successful” we can begin to better understand how achievement goals lead to positive and negative
academic outcomes, and uncover new directions for research in this area of learning. This will be done by answering the following three research questions:

1. Are there differences in motivation within and/or between tasks associated with a multi-step learning project?

2. Does the introduction of a performance oriented task impact students’ use of reading strategies during a mastery oriented project?

3. How do students’ outcome standards relate to their academic motivation?
CHAPTER THREE

MATERIALS AND METHODS

Introduction

The previous chapter explored research linking achievement goal theory, self-efficacy, and strategy use. From that research, three questions arose. This chapter will focus on the methods by which those questions were answered. As explained briefly in the introduction, the framework for this study was a learning project. The project had two main tasks. The first task required students to read a short trade book; the second task required them to design a zoo based on what they had learned from the book. The methods described here are based on the tools and protocols by which researchers have traditionally gathered information on motivation and strategy use.

Briefly, this study employed a cross-sectional, quasi-experimental design. The target population was upper elementary school students, those completing their final year of elementary school before beginning middle school. In this study, the population was represented by fourth grade students from a single K-4 elementary school in Eastern Massachusetts. The independent variable was the goal condition, determined by group assignment. Several dependent variables
were measured under the influence of the independent variable: personal achievement goal orientation, outcome standards, and learning behaviors. Goals, self-efficacy, and outcome standards were measured during each of the two sessions, making it necessary to have a small battery of instruments that could capture data at the appropriate times across the two sessions in which students participated.

Population and Sampling

Recruitment

Participants were recruited from a single elementary school within the Natick school district of Massachusetts. This particular elementary school is the largest of five in the district, with five fourth grade classrooms in the building. At this particular elementary school, there is a significant focus among the administration and faculty on student motivation. Over the past three years, a school-wide program that recognizes academic effort and responsibility has been implemented. Literacy is also a main focus of the school, although no specific reading program is used. Instead, teachers are encouraged to use a balanced approach to literacy, focusing on both reading and writing. Many of the classroom teachers choose to use the guided reading method to teach literacy skills. They emphasize fluency and comprehension along with good decoding and word recognition. Strategy instruction begins in Kindergarten, and is
emphasized throughout the five grades. Classroom teachers are encouraged to attend professional development workshops on a regular basis to build their own knowledge of reading strategies, and literacy instruction practices.

Having received approval from the Institutional Review Board at the University of New Hampshire, initial contact was made with the school principal, who granted permission for the research to be conducted. Following this initial contact, the researcher worked primarily with the vice principal and classroom teachers in organizing participant recruitment, as well as the space and time for working with participants.

Letters of consent were written to parents or legal guardians, asking them to indicate whether or not their child had permission to participate in the study. The letter was approved by the UNH Institutional Review Board. Copies of the letter were sent home to parents via the classroom teachers.

Classroom teachers were asked to choose students from their classes to receive informed consent letters. The teachers were directed to select any students who were not receiving services for reading or behavioral disabilities, who did not have 1:1 aides, and who did not have physical or mental disabilities that would prevent them from independently accessing the materials associated with this study. Initially, each of the five classroom teachers were given 15 letters each to give to students they felt matched this criteria.
Participants

The target population for this study was students completing elementary school and preparing to make the transition to middle school. In the accessible school district, this transition occurred at the end of fourth grade. The school district in question is predominantly white; 96.2% of students identify as Caucasian. The next largest ethnic group is Asian, 5.2%, and all other ethnic groups are represented by less than 1% of the school population. A very small percentage of the population qualifies for free or reduced lunch; 2.5% and 1.0% respectively. Every effort was made to ensure the selected sample represented the overall demographics of the school itself. However, attrition within the study made it challenging to ensure this in the final sample.

Because MCAS testing was completed shortly before this study, it is possible to report on the achievement of the population from which this sample was drawn. In the fourth grade class at this particular school, 22% of students scored as Advanced, and 68% scored as Proficient on the English Language section of the 2010 MCAS tests. Of the remaining 11%, only 3% of students scored as Failing. Given the instruction to teachers to recommend students who were reading at or above grade level, these MCAS scores indicate that even with these
parameters, the subject pool was representative of the majority of fourth grade students in this school during the 2009-2010 school year.

The school from which participants were recruited had a total of 102 fourth grade students. Fifty one students returned signed permission slips. Of those, 6 students did not receive permission to participate, and 45 did. After attrition, a total of 37 students participated in both sessions of the study; 16 were boys and 21 were girls.

Once all of the permission slips were returned, teachers were given the names of their students who had elected to participate in the study. The 37 students were then divided to create two conditions. Initially, it had been hoped that random assignment to groups would be possible. However, because of scheduling conflicts among the five classrooms, it was not possible to find a time when students from each classroom could simultaneously be available, and when there was available space in the school building. The main conflict was with Specials throughout the day. The research and teachers were concerned that students would be unwilling to miss Specials, and would therefore be unwilling to participate in the study. Therefore, it was determined that the students from each classroom would be kept together.

Students from the five classrooms were divided into three groups to account for some classrooms having more students return signed slips than others.
Classrooms were combined based on the recommendation of the five teachers and on scheduling. The two classrooms with the lowest numbers of participants were combined to create Group One; of the three remaining classrooms, two were combined based on availability to create Group Two. The fifth classroom operated as a distinct entity: Group Three. Each group received one of two conditions; group one (n=9) and group three (n=9) were considered to be the “mastery” condition, while group two (n=19) was the “performance” condition.

Data Collection

Conditions

Two “treatment” conditions were created for this study. The condition was presented through the directions for the reading task in session one. One half of the participants were given directions that emphasized a mastery orientation, while the other half was given directions that emphasized a performance orientation. The directions were intended to emphasize the elements of either achievement goal orientation. As discussed in the previous chapter, these two goal orientations are related to different interpretations of the purpose of task engagement. A mastery orientation is associated with a sense of personal growth, comprehension, and effort. Performance oriented students, on the other hand, are concerned with their ability to get things right and to do better than their peers on tasks. The direction associated with either condition in
this study emphasized a particular goal by directing participants to either their personal learning or their performance on a quiz. The mastery condition directions stated that students would be responsible for gauging their own achievement while the performance condition directions stated that the researcher would assess students’ achievement.

The directions for the reading task followed a description of the overall project, including a brief description of the second session and the zoo building task. The complete directions can be found in the appendix. The sections of the reading-task directions that introduced either condition are presented here; italics were added here for emphasis:

**Mastery Condition Directions.** The purpose of reading the book is to learn as much as you can about the region you are responsible for designing. While you are reading, you should take notes about things you think might be important. In order to know whether or not you are learning, I am going to ask you to start by writing down anything that you might already know about the region I am giving you. Then, *when you are done reading, I will ask you to look at what you knew before reading and compare it to what you learned during reading, and will have you do a short worksheet that will help you to remember what you read about.* Then you can tell me if you think you are ready to go on to the next phase of the project.
Performance Condition Directions. The purpose of reading the book is to learn as much as you can about the region you are responsible for designing. While you are reading, you should take notes about things you think might be important. In order to know whether or not you learned enough, I am going to ask you to take a short quiz when you are done. Based on the grade you get, you will know if you did well or not. You want to try to do really well on the quiz because it will let me know if you are ready to go on to the next phase of the project.

All directions were read aloud by the researcher, and participants were encouraged to ask questions for clarity.

Location

Each group met with the researcher in the school’s cafeteria. At the beginning of each session, participants were asked to sit at one of four tables on the stage portion of the cafeteria while the researcher read directions for the session and handed out necessary materials. Once the directions and materials had been distributed, participants were allowed to sit at any of the tables in the cafeteria. During the first session, most participants chose to sit at tables by themselves or in pairs. During the second session, each group chose its own table. The researcher walked around between the tables, checking in on participants/groups throughout both sessions.
Each group met with the researcher separately, on two different days, one week apart. Each session lasted one hour. The two conditions differed only on their directions for the reading task, as explained above.

**Reading Materials**

The reading material was a number of short content-area trade books about biomes and ecosystems. These texts are leveled as appropriate for readers between third and fifth grade. There were a total of five different texts, each representing a different region of the world: deserts, grasslands, tropical rainforests, deciduous forests, and the tundra. These books were chosen based on their subject area being of general interest to students of this age. Previous research and an early pilot study related to this project confirmed that students find books about animals of particular interest, and are therefore likely to read them willingly. Within this overall theme, students were randomly assigned the books they read.

As there were not enough students in either group for each book to be represented equally, the researcher had to decide how best to distribute the books. The decision was made to give preference to those books that were likely to be less familiar to participants. Therefore, the books were prioritized as follows: tundra, grasslands, tropical rainforests, deciduous forests, deserts. In order to ensure that the book topic was not a source of bias in any of the analyses
done after data collection, an ANOVA was used to compare each of the variables by book topic, as a categorical variable. No significant differences were found on any measure. These results can be found in the appendix.

**Session One: Reading for Information**

During the first session, the reading task, participants worked independently. Before any materials were given to them, the directions (as reported above) were read aloud. After the directions had been read, materials were handed out.

Participants’ main priority during the first session was to read the materials given to them. There were a total of five different books, with approximately 3 -4 students per condition receiving each book. Students were encouraged to ask questions as necessary for clarification.

Participants were each given a manila envelope with a book, the three surveys that pertained to the reading task, and a piece of paper on which they were asked to record their prior knowledge and to take notes while reading. The contents of the envelope were explained to all participants before they were distributed. Participants were asked to put their names on the envelopes, so that they would be able to locate it throughout both sessions. They were asked not to put identifying information on their individual work but many of them did anyway.
To begin, all participants were asked to open their envelopes and take out the book and surveys. They were given a moment to look at the book, although they were asked not to read beyond the front or back covers. Then, they were asked to complete the first (Before Reading) motivation survey. This survey included the first set of sentence stems.

Once they had completed the survey, and before they began reading, all participants were asked to write down any prior knowledge they had of the book’s topic. Once they had written down anything they could think of, they were told they could begin reading. During reading, students were asked to take notes.

Once the researcher determined that all of the participants in the session had had time to write down their prior knowledge, and to begin reading the book in earnest, after approximately 7-8 minutes, students were asked to pause and to complete the During Reading motivation survey. They were then instructed to return to their place in the book and continue reading.

Participants were given warnings as the time went by, letting them know how much time they had left to read. With approximately ten minutes left, students were reminded to make sure they had at least read the book chapters that pertained most to the animals, so that they would be able to design their zoo.
Once they had reached the end of the book, participants asked to complete a checklist indicating what strategies they used during reading. They were instructed to put a checkmark next to any strategy that they felt they had used while reading. For students who did not reach the end of the book by the allotted time, they were asked to stop reading and complete the checklist based on the reading they had done.

After completing the checklist, participants were asked to complete the After Reading motivation survey.

Those participants who were able to finish with enough time left were then given a short worksheet to complete that measured their memory for what they had read. Participants in the mastery condition were told that the purpose of the worksheet was simply to give them exposure to the material, and to help them remember what they had learned. In the performance condition, the worksheet was referred to as a “quiz” that would be graded by the researcher. Participants in both groups were told that they could use any notes they had taken while reading to help them answer questions, but the researcher collected the books before handing out the worksheets.

At the end of the hour, participants were returned to their classrooms.
Session Two: Building a Zoo

During the second session, the zoo task, participants were given tasks intended to force the application of information they had learned during the previous session. One such task was a worksheet on which participants worked independently; the second task was done in small groups.

Groups were based around the books that participants had read in the first session, such that each group contained a student who had become familiar with one of the possible biomes. As each student had read a different text, participation from all group members was necessary for successful task completion. Within each condition, four small groups were created. Participants were told their group assignments at the beginning of the session.

Students were given their manila envelopes from the first session containing the work they would be responsible for during the second session. For this second task, two additional surveys and a worksheet were added to the envelopes. The envelopes still contained the notes the participants had taken the week before, which they were allowed to use during their zoo designing task. Before they were asked to do anything, students were given a thorough explanation of what was in the envelope, and what they were responsible for completing during the session.
Before participants began their work, they were given directions for the session. Unlike the first session, the directions for this task did not include any endorsement of one achievement goal or another. They were simply given directions about the tasks they were expected to complete throughout the session without any researcher-imposed goals or standards of success. Complete directions can be found in the appendix.

After the instructions and group assignments were announced, students’ envelopes were returned to them. Before doing anything else, they were asked to remove from their envelopes and complete a motivation survey (Before Zoo Motivation), similar to the one they completed before the reading task.

Once they had finished the survey, participants were asked to complete as much as they could of the Zoo Planning worksheet, designed to assess students’ memory of the information that had been presented in the books. This worksheet included questions asking for concrete information about the climate and animals; inferential questions asking students to compare and contrast the biome they read about with the one they live in; and open-ended questions asking students to reflect on what they would like people to learn from a visit to their zoo. Included with this worksheet was a list of all the animals and plants included in all of five books, from which participants were asked to identify
those found in their biome. They were told that they could use this worksheet and the attached list when sketching their zoo independently and as a group.

Once they had completed the first survey and the worksheet, students were told they could take out their notes from the previous week and begin designing their portion of the zoo. Each participant was asked to create a sketch of their own area before working as a group on the larger poster of the entire zoo. Each individual was given white sketching paper to use. Each group was additionally provided with one piece of poster board, glue sticks, colored pencils, markers, scissors, and tape. Groups were also given examples of maps from actual zoos across the country, including small local zoos (Franklin Park, Boston, MA) and larger zoos (San Diego and Cincinnati). These maps were printed out and available to any of the groups to look at as they planned their own zoos.

Participants were allowed to work in groups until there were five minutes left in their session. At this point, they were asked to stop working and to complete the final (After Zoo) motivation survey. Once this was completed, students were instructed to return all of their materials to their manila folders, and to clean up the materials they had been using. They were then taken back to their classrooms.
Instruments

This study utilized five main measurement tools: a five-part, self-report motivation survey, sentence stems, prior knowledge forms, strategy checklists, and notes taken by students. Each of the instruments is described here.

Five-Part Motivation Survey

A series of five surveys was developed for use in this study. These can be found in the Appendix. The purpose of the surveys was to collect data about students’ motivation for the reading and zoo tasks. One survey was presented at a time, at five separate times across the two sessions. The first three surveys, administered immediately before, during, and after the reading task, related to students’ achievement goals and self-efficacy. Students were also asked to complete two surveys related to the zoo designing task, one immediately before and one after. These two surveys also measured achievement goals and efficacy.

Each survey was a series of statements to which students were asked to indicate their level of agreement using a Likert scale of one (strongly disagree) through five (strongly agree). Although some researchers have claimed that a seven-point scale is particularly effective, (Preston & Colman, 2000), more recent researcher concluded that a five-point scale is more appropriate for elementary school-aged children. (Adelson & McCoach, 2010) A five-point scale was also favored by the instruments from which this survey was developed. (Midgley et
Additionally, each number was attached to a phrase of agreement, which has been shown to be more comprehensible to respondents than are numbers alone. Self-reports and surveys common in motivation research often use Likert scales to gather information. These surveys are generally administered separate from the learning event, or immediately before it and there is no after-task measure. However, theoretical work on AGT has stated that goals require a standard or end-point that is used to understand achievement. (Latham & Brown, 2006; Meece, Anderman, & Anderman, 2006; Nicholls, 1984) For that reason, two after-task surveys were included in order to add to the literature on achievement goals.

The statements were intended to elicit participants’ feelings on a number of constructs: mastery goal orientation, performance goal orientation, and efficacy (both of the individual and of the group). The statements themselves were developed based on the statements used on other similar surveys intended to measure the same constructs. Of particular utility and influence were the Patterns of Adaptive Learning Survey (Midgley, et al., 2000), the Achievement Goal Questionnaire, (Elliot & Church, 1997) and the Motivation for Reading Questionnaire (Wigfield, McGough, Bennett, & Rice, 1996). The PALS and AGQ were particularly helpful in writing statements pertaining to achievement goals, while the MRQ was used to develop statements about self-efficacy for reading.
Unlike the PALS, AGQ, and MRQ, the statements included on this instrument were not intended to be generalized to all reading tasks. They were explicitly introduced as relevant only to the book that had just been assigned. The reason for this was two-fold. First, this allowed analysis of students' understanding of the immediate condition as introduced through the directions. This study specifically measured situational motivation, requiring the survey items to place careful emphasis on the context. Second, because participants were fourth grade students, they were not necessarily familiar with thinking about their goals or self-efficacy. It was hoped that specifying the situation would lend a sense of concreteness to the statements, making it easier for students to gauge their agreement.

All statements on the five surveys were affirmatively worded, to avoid the confusion that can result from negatively worded items. (Barnette, 2000) Elementary students in particular can have trouble with negatively worded items, creating a threat to the validity of the scales. (Benson & Hocevar, 1985) Therefore, each of the items was an affirmatively worded statement referring to a mastery orientation, a performance orientation, or self-efficacy. The challenge in achievement goal measurement is to create adequately bidirectional direct statements. Given that students can hold multiple goals at a single time, it cannot be assumed that students' responses to positively worded mastery
oriented statements will be the reverse of their responses to positively worded
performance oriented statements.

Another way in which the surveys were constructed to be more
comprehensible to elementary students was by reducing the number of
constructs measured. The items on the scales used in this study did not include
the same range of constructs as the PALS, AGQ, or MRQ. The PALS and AGQ
differentiate between approach and avoidance goals, which this instrument did
not. The wording of avoidance statements necessarily include negative words
and phrases; for example “One of my goals is to keep others from thinking I’m
not smart in class.” (PALS, Performance-Avoidance Goal Orientation, Revised)
The negative wording of such statements could have disrupted the scales’
validity if students misunderstood or were unwilling to indicate agreement; for
this reason, performance-avoidance goals were not included on the scale.

Reducing the number of constructs also reduced the length of the scales,
another methodological concern. The MRQ has items that relate to 11 different
constructs, which are measured with more than 50 statements. Given the
objective of measuring motivation at five different points across the study, it was
necessary to significantly reduce the number of statements on each study. Had
longer versions of the surveys been used, it likely would have become
burdensome for the students. There was also concern that including too many
items would inadvertently reintroduce some of the deselected constructs, confounding the results. (Hulleman, Schrager, Bodman, & Harackiewicz, 2010)

The final element in the decision to pare down the number and type of items included on this instrument was made based on the length of time needed for students to both complete the surveys and to complete the other assigned tasks. The main goal of this study, and the methods that were adopted for it, was to examine motivation within the context of a specific task. Therefore, it was necessary to assign both the task and the survey concurrently. The challenge with such a method is the amount of time available to students to complete all of this work. Out of concern that students would not be able to finish enough of either assignment to accurately respond to the survey statements about the assignment, the decision was made to shorten each survey so that each construct was measured in as succinct a manner as possible. Although a longer survey would have undoubtedly produced more robust results, those results would have been meaningless if they came at the cost of students not being able to complete the assigned tasks.

A complete list of the survey items can be found in the Appendix, and on page 102 in Chapter Four. Items measuring mastery goal orientation included statements such as I want to learn a lot from this book, and It is important to me to understand what I read. Performance goals, on the other hand, were measured
with agreement to statements such as *I will only be happy if I do better than everyone else* and *It is important to me to be the first one done.* The third component, efficacy, was measured with statements such as *I am a good reader, I feel like I am doing well on this assignment,* and *I will be able to help my group.* The individual items were originally taken from previous studies of achievement goals and self-efficacy, and then were refined through two pilot studies. By retaining the essential affective wording of the original statements, validity was protected for the final surveys. For those statements relating to a mastery orientation, the words *learn, understand,* and *master* are common among the PALS, MSRQ, and AGQ. For the performance oriented statements, the phrases *better than* and *compared to* in relation to other students were taken directly from previous surveys.

**Reliability.** The reliability of the five motivation surveys was established with an exploratory factor analysis to confirm the matching of intended items. Once the sub-scales were established for each survey, the reliability of each was determined with an estimated Cronbach’s Alpha (α). For each sub-scale, α > .65 was considered reliable, and that sub-scale was included in the final analysis. For this study, alphas ranged from .65 to .79.

**Validity.** The validity of an instrument, such as a scale or survey, is degree to which it represents the real-world construct they intend to measure. (Clark & Watson, 1995; Haynes, Richard, & Kubany, 1995; Light, Singer, & Willett, 1990)
When determining the validity of an instrument, it is important to consider not only the individual items, but also the format in which those items are presented, and the directions given to participants. Ultimately, validity is relative to the context in which the instrument is used, and the inferences the researcher hopes to draw from the collected data. (Haynes, Richard, & Kubany, 1995; Light, Singer, & Willett, 1990)

Validity for an instrument operates at a number of levels. *Construct validity* refers to the overall ability of an instrument to assess the construct it is intended to assess. In order to determine if an instrument has strong construct validity, the construct in question must first be well defined from a theoretical perspective. (Clark & Watson, 1995) The definition can then be used to develop scales, and these scales must be tested against real-world manifestations of the intended construct to ensure that they are appropriate for the intended sample, and for the inferences to be made from them. (Light, Singer, & Willett, 1990) An instrument must also have *content validity*, which is a measure of the individual items of which it is comprised. (Clark & Watson, 1995; Haynes, Richard, & Kubany, 1995; Light, Singer, & Willett, 1990) An instrument has content validity when the items address all of the domains that make up a construct. One way to establish validity is by assessing how well items converge or diverge as anticipated by the construct’s definition. (Light, Singer, & Willett, 1990) Items
that are intended to measure the same construct should converge, while items
measuring unrelated constructs should not.

It is essential that construct and content validity be established for an
instrument as it impacts what inferences and conclusions can be drawn from the
findings. The challenge of validity is that it is not necessarily stable over time.
As an instrument is used in varying contexts, the validity can also vary.
(Haynes, Richard, & Kubany, 1995; Light, Singer, & Willet, 1990) For that reason,
even items whose validity has been established need to be re-evaluated when
they are used in new contexts. In this study, established items were taken from
published scales and put into the new context of the Five-Part Motivation
Survey. This necessitated a re-evaluation of the validity of those items.

The items that were drawn from previous instruments were those that had
strong content validity in their original forms. However, in rewording them for
this instrument, their validity was jeopardized and needed to be reestablished.
To some extent, face validity was assumed for the items of each subscale based
on the established definitions for each construct. Later factor analysis and item
matching revealed a strong correlation between the appropriate items,
suggesting good convergent validity. For example, those items which were
intended to represent a mastery approach goal, based on the definition of that
construct from AGT literature, did load together to create a single subscale. The
same is true of items representing a performance approach goal, and self-efficacy. Not surprising, there was only a weak negative correlation between the mastery and performance sub-scales. This was an anticipated relationship given that students can hold multiple goals for a single task. Although it eliminates the possibility of establishing divergent validity, it does support findings from previous research that goals are not mutually exclusive. (Barron & Harackiewicz, 2000; Daron, Dompnier, Gillieron, & Butera, 2010; Kaplan, Middleton, Urdan, & Midgley, 2002) Other measures from this study help to establish convergent validity as well. The distribution of mastery and performance oriented responses from the sentence stem completion task match findings from the achievement goal subscales, helping to confirm convergent validity.

**Sentence Stems**

The before-reading survey and before-zoo survey also included two short sentence stems that asked participants to state, in their own words, their goals and outcome standards for each task. Previous research on achievement goals has not included this particular method, but the use of sentence stems is very popular within the psychological community, including both researchers and clinicians. (Holaday, Smith, & Sherry, 2000). Typically, sentence completion tasks are used as a way to collect individual-valid data about internal processes.
in an informal manner that provides structure without hindering spontaneous completions. (Dyken, Schwenk, Maxwell, & Myatt, 2007; Pincus, Santos, & Morley, 2007) Sentence completion tasks require individuals to generate the ending of sentences in response to a particular stem. Participants or patients are encouraged to write down the first thing that comes into their mind. Unlike Likert surveys or norm-referenced instruments, sentence completion tasks reduce the likelihood of response bias. (Pincus, Santos, & Morley, 2007) For this study, the purpose of including the stems was to pilot an additional way in which to measure students’ achievement goals, since sentence completion tasks are not common in AGT literature. Additionally, the use of sentence stems provided a method to explore students’ outcome standards, which are also not a traditional piece of AGT literature.

In this study, two sets of stems were used. To measure students’ achievement goals for the reading and zoo tasks, the stems were In my own words, my purpose for reading this book and In my own, words, my purpose for this project is… while the standards stem was I will know I did a good job (reading) if…. Students were then asked to complete these sentences. Although these stems are somewhat short, they are typical of the stems used in sentence completion tasks, which often have only two or three words. (Dyken, Schwenk, Maxwell, & Myatt, 2007; Pincus, Santos, & Morley, 2007) During the first session, it was pointed out to students
that the directions for the task included both a possible goal and a possible standard of success. For the second session, students were explicitly told that they needed to determine their own goal and standard. Students were assured that there was no right or wrong way to complete the stems, and were instructed to write whatever they were thinking.

**Reliability and Validity.** Reliability and validity of sentence stems was assumed to be acceptable based on previous literature citing their use in psychological work aimed at collecting data on thoughts and feelings in a variety of clinical and practical settings. (Barton, Morely, Bloxham, Kitson, & Platts, 2005; Dykens, Schwenks, Maxwell, & Myatt, 2007; Pincus, Santos, & Morley, 2007)

**Prior Knowledge**

Before beginning to read the book give to them, participants were asked to record their prior knowledge about the topic they were assigned. There was a space provided for them to do so. The free-recall method of collecting information about students’ prior knowledge has been used in previous studies. (Dochy, Segers, & Buehl, 1999; Hailikari & Nevgi, 2010; Hailikari, Nevgi, & Lindblom-Ylanne, 2007) Although there are several others methods of collecting information about prior knowledge, this method taps into students’ declarative knowledge of a topic, as opposed to their procedural knowledge, which was the
goal of including this measure. The researcher was interested only in what facts the students knew about their assigned topic. The data was used only to control for differences associated with prior knowledge, not as a main variable. Therefore, a measure of students’ procedural knowledge was not necessary. In the context of this study, procedural knowledge would have referred to students’ knowledge of how to design a zoo, which was not something assumed to vary significantly between individuals at this level. The use of free-recall methods for understanding students’ prior knowledge comes with some risks. The most viable threat to validity is a student’s limited verbal ability. (Doucy, Segers, & Buehl, 1999) In the sample population, all of the students were reading and writing at grade level, significantly reducing the likelihood that this would be a problem. It was also deemed a necessary risk, as the free-recall of prior knowledge played an important role in producing the mastery condition.

The act of recording prior knowledge was also a significant part of the two conditions. The prior knowledge was specifically referred to in the directions given to participants in the mastery condition (“... when you are done reading, I will ask you to look at what you knew before reading and compare it to what you learned during reading…”). For students in the performance condition, no specific mention was made of using the prior knowledge and notes together to assess their own learning. However, it was important that the performance
condition group record their prior knowledge for continuity between the two groups.

Reliability and Validity. The reliability and validity of this instrument is assumed based on a tradition of such activities being used in elementary school classrooms. The type of prior knowledge collected here is what Dochy et al (1992) would define as declarative knowledge. As such, it was collected via structured free-recall. (Dochy, 1992; Hailikari et al, 2007) In classrooms, prior knowledge is often collected before reading tasks; graphic organizers such as Known-Want to know-Learned (KWL) charts require students to self-generate prior knowledge before reading with the explicit purpose of comparing that knowledge to what is learned during reading. (Cooper, 2006; Frey & Fisher, 2007; Tompkins, 2006) For this study, the full KWL chart was not used, although the notes section functioned in the same capacity as the “L” box on a traditional chart.

Strategy Use Checklist

In general, there are two main ways in which researchers have aimed to measure strategy use from readers. Some researchers have collected information about reading strategies through the use of checklists. (Turner, 1995) The more common method is the verbal protocol. (Duke & Mallette, 2004; Hildren & Pressley, 2004) Readers are asked to verbally report on their comprehension-
supporting mental activities either during or immediately after reading. This method requires not only cognitive awareness, but also metacognitive knowledge. (Pressley, 2002) When done during reading, it also requires ability to monitor these while still actively reading. Checklists can be helpful in that they do not require the same amount of self-monitoring as a verbal protocol, since readers do not need to generate their own list of strategies. In this study, a checklist was used to gather this information about students' reading behaviors. It was determined through two pilot studies that a checklist was the more effective and easier way for students to indicate what strategies they had used. This survey can be found in the Appendix. During an early pilot study, students were asked to indicate their strategies in a free-recall format. This proved to be particularly challenging for students, and the researcher ended up having to elicit responses by reading a list of possible strategies. Although verbal protocols are common in the literature on reading comprehension strategies, the researcher felt that asking students to report on their strategy use during reading would negatively impact students' learning by interrupting their focus.

It was impossible to know beforehand exactly what strategies students would choose. The items on this checklist are strategies most commonly reported by readers (Pressley, 2002) and commonly appearing in research about strategy use. (He, 2008) The specific strategies included were drawn largely from work on
content area learning, since that is the type of reading that participants were asked to do in this study. Strategies included on the checklist represent a variety of behaviors used by both good and less proficient readers, designated as *deep processing* and *surface processing*. (Nolan, 1988) In general, surface processing strategies are less strongly related to long term learning because they are aimed at rote memorization of discreet facts. Surface level strategies were represented by items such as *I skipped over things I did not understand and I wrote down exactly what the book said in my notes*. Deep processing strategies, however, are behaviors aimed at transforming information from text into the reader’s own words, at connecting new information to prior knowledge, and at the self-monitoring of comprehension. Examples of deep level processing strategies include items such as *I took notes in my own words to help me understand better, I made connections with other stuff I know about this topic, and I used the pictures, charts, and graphs to help me understand the words*. Like the survey statements, the strategy statements were all presented in direct, positive language to avoid any confusion. Although some studies have identified up to 26 different strategies (He, 2008), this study included only 19 strategies to avoid problems with over-reporting. (Wolters, 2004)

**Reliability and Validity.** Reliability and validity of the strategy checklist was established in several ways. First, to a large extent reliability and validity were
assumed based on the use of checklists in the literature. (Turner, 1995) Second, in two pilot studies, strategies were assessed either through verbal report or with the use of a checklist. Students were more able to accurately report the strategies when aided by a checklist. Third, the items on the checklist itself were subjected to exploratory factor analysis and reliability testing (α) in order to look for patterns in students’ strategy use.

**Note Taking**

During reading, students were asked to take notes on information that they thought would be helpful or important during the second session. A space was provided for note taking, and they were also told that they could use lined paper as necessary, if they needed more room to write. Students were not given any sort of instruction on the formatting of notes. One area of interest in this study was a possible difference in the way that students organized information based on their achievement goal orientation. An outline for a graphic organizer would have imposed a specific form of organization on students’ notes. Another potential problem with a graphic organizer chosen by the researcher was familiarity; it would have been problematic if only some of the students were familiar with the form.

Notes were included in the assessment battery because they can be used as concrete evidence of learning to both the reader and the researcher. As the
students recorded information, they were able to visually compare their notes to their recorded prior knowledge. This provided students with a concrete gauge of learning, and possibly with a source of efficacy. After reading, while working on the worksheet/quiz, participants were allowed to refer back to the notes that they had taken, but were not allowed to use the book any longer. During the second session, students were allowed to use their notes when designing their zoo.

Reliability and Validity. The reliability and validity of the note taking instrument was assumed to be acceptable based on their common use in classrooms, (Frey & Fisher, 2007) and previous research on assessing notes. (Altemeier, Jones, Abbot, & Berninger, 2006; Peverly et al, 2007; Slotte & Lonka, 1999) During the second pilot study, students were asked to take notes and no threats to reliability or validity seemed to be present. Additionally, following the second pilot study, the research conducted an informal survey of the students who participated. Each reported that taking notes was a common practice in their classroom.

Additional Activities

Application was measured through three different tasks. These tasks were designed to mimic typical classroom activities that would be associated with reading for learning. During the first session, participants were asked to
complete a worksheet after they had finished reading. The worksheet included
three to four vocabulary words that students were asked to define, seven to eight
short answer questions, and a space where students were asked to draw a
picture showing what they had learned during reading.

During the second session, participants were asked to complete a “zoo-
planning” worksheet designed to measure their recall of information from the
text. Although all participants had plenty of time, many of them rushed through
this part in order to begin work on their drawings. Students were instructed to
answer as many questions as they could. Students were then asked to complete
a sketch or drawing of their proposed area of the zoo. The instructions stated
that they were allowed to use their notes from the previous week to help them
decide what animals to include. Finally, with whatever time remained, the
students worked in groups to create a diagram of their proposed zoo.

The worksheets assigned to students after reading and before the zoo task
were collected, but not ultimately scored. As will be discussed in more detail,
time was a significantly limiting factor in this study. Many of the participants
did not have enough time to finish the worksheet during the first session, which
made it impossible to score accurately. Furthermore, completion of the first
worksheet may have caused a difference in students’ ability to recall information
for the worksheet during the second session. For that reason, neither of the
worksheets were scored or analyzed in this study. Despite this, their inclusion was important; these activities anchored the study in familiar classroom-like activities.

Students' drawings and the group zoo models were also not scored or analyzed in this study. Again, time was a limiting factor. It did not seem appropriate to attempt to quantify students' or groups' work when there was no way to account for the amount of time each student or group actually spent on each item. Another issue that arose was a lack of a valid or reliable scoring method for students' drawings. At this time, there is no established way to quantitatively evaluate art work for evidence of learning, strategy use, or motivation.

**Design for Analysis**

This study used a quasi-experimental design to answer three research questions, each with related sub-questions. Several instruments were used to collect data about students' achievement goals, self-efficacy, and learning behaviors. Data collected from those instruments was analyzed using a variety of statistical methods. Table 3.1 on page 96 summarizes the questions, instruments, and analysis featured in this study.

The findings from the three research questions were understood based on results from analysis of differences in student achievement goals and self-efficacy
related to their membership in one of the study’s two conditions, and in the amount of prior knowledge the students in each condition had before participating in the study. These two analyses were important because each provided the research with important information about the context of students’ responses on the data collection instruments. Prior knowledge has been shown to have a significant relationship with students’ use of learning strategies. (Braten & Samuelstuen, 2004) Based on the literature, it was expected that goal condition would lead to significant differences in both goals and learning behaviors. Therefore, it was necessary to measure the strength of the condition on students. To determine this, an independent t-test was used to compare mean scores on the achievement goal sub-scales of the motivation survey. Differences in mean prior knowledge scores were also measured with an independent t-test.

The first research question asked about the stability of students’ achievement goals over the course of a learning project. Based on literature on achievement goals it was hypothesized that students may experience shifts in their goals within and between the two tasks. In previous research, this has not been examined at the within-task level. In order to assess this, students’ mean scores on the sub-scales related to achievement goals and self-efficacy were correlated across the five motivational surveys using a Pearson’s r. Additionally, students’
responses to the goal-related sentence stems were compared using a Chi Square test of independence.

The second research question asked about differences in students' learning behaviors based on their affiliation with one or the other condition, their motivation survey sub-scale scores, and their goal-related sentence stems responses. From literature linking achievement goals and learning behaviors, it was hypothesized that students' orientation toward either a mastery or a performance goal would determine the quantity and quality of the learning strategies they used. To determine whether this hypothesis held in this context, a variety of statistical methods were employed. Independent t-tests were used to compare mean strategy checklist and note scores by condition. Pearson's $r$ was used to measure the strength and direction of the correlation between mean strategy use and notes scores, and the mean scores students received on the achievement goal sub-scales. Finally, one-way ANOVAs were used to determine the relationship between mean strategy checklist and note scores, and the three categories of goal-related sentence stems.

The final research question asked about the outcome standards that students reported endorsing before beginning the two tasks they were assigned. Previous research on achievement goals has not taken into account students' outcome standards, although the concept of an outcome standard is mentioned in the
literature. Research on motivation that focuses on students' attribution beliefs (Graham & Weiner, 1996) has recognized the importance of how students assess themselves after completing a task, although even in that body of literature there is no history of using sentence stems to elicit spontaneous outcome expectancies or standards. To explore the data collected through the sentence completion task; descriptive statistics were used, including a frequency table. Answers were coded and compared to data from the other instruments. A Chi Square test of independence compared answers from the first and second tasks as well as the relationship between the two sets of sentence stems, and the goal condition; an independent t-test compared mean goal sub-scale scores, strategy checklist, and note scores of students divided by their outcome standards.

Data Analysis

This section details the data analyses used to answer the research questions of this study. A complete table of the research questions, related sub-questions, as well as plans for analysis can be found in the appendix.

Prior Knowledge

Prior knowledge was rated on a scale of 0-3, corresponding to none-low-moderate-high levels of knowledge. A zero was given to students who did not write down any information. A one was given to entries of one or two facts, or erroneous information. A two was given to entries containing two or three valid
facts presented in unclear or limited language. A three was given to entries with four or more facts, with clearly expressed ideas.

Students' prior knowledge was measured in order to understand how it might have contributed to their motivation and strategy use. It was compared with students' scores on the five motivation surveys, the strategy checklist, and the notes. This analysis was necessary because of the strong link that prior knowledge has with other elements of achievement, such as motivation, in the literature.

This study addressed two main research questions. The first, are there differences in motivation within and/or between tasks associated with a multi-step learning project, was answered by comparing data about students' goal orientations and self-efficacy on the five self-report surveys and the two sets of sentence stems. In addition to descriptive data, Pearson's correlations and t-tests were used to look for evidence of stability and change in goals and self-efficacy both within the reading task and between the reading and zoo designing task.

**Five-Part Motivation Survey**

Students' responses to the various sub-scale items that made up the five motivation surveys were averaged, resulting in a single score for each construct. Scores on each construct were compared via a Pearson's correlation to determine the level of association between each. Had this study used a repeated measures
design, it would have been possible to assume that the sub-scales across each of
the five surveys were significantly correlated. However, given the difference in
language on each survey, this was not assumed, and a correlation was necessary
to understand the level of correlation between the sub-scales. These correlations
were also used as evidence for change in students' response patterns. Although
the measures were not true repeated measures, the language in each sub-scale
was as similar as possible while still accounting for the progression of time. For
that reason a failure to find a significant positive correlation between items that
should have been related, based on their wording and correlation with other
similar items, was taken as evidence of a difference in students' agreement with
the sub-scales, not as an underlying difference in the scales themselves.

In some cases, t-tests were also used to look for significant differences in the
mean scores on specific sub-scales. This provided additional evidence for
changes in students' motivation across the two tasks.

**Sentence Stems**

The sentence stems were coded, using a simple categorization system.
Sentence stems asking students about their goals were coded as either *mastery* or
*performance*. A code of mastery was given to any sentence stem response that
included the concepts of *learning, effort, understanding, or knowing*. In general,
these were statements that focused on the process of learning, including but not
necessitating students explicitly mentioning what they wanted to learn or get better at. A code of performance was given to stem responses that mentioned doing better than peers, grades/scores, or approval from the teacher or specifically mentioned a product of some sort, such as the quiz or the zoo model. These were statements that focused on the product of learning, and many implied a sense of competition among students. As discussed in the previous chapter, the main difference between mastery and performance goals is whether learning is seen as an end or a means to an end. In coding student sentences, those statements that referred to the learning process were considered mastery, while those referring to the product of learning were coded as performance. The statements referring to students’ outcome standards were coded as either internal or external. Internal codes were given to statements that referred to things within the student, such as feelings, emotional responses, behaviors; basically, affective standards. External codes were given to statements that mentioned elements outside of the student: grades, work, teacher approval, other students, and a final product.

Sentence stems were coded by two separate raters. The first rater was the main researcher in this study. The second rater was a teacher familiar with student work at this grade level. The second rater was trained by the first rater, and discussion was encouraged to clarify codes for difficult student responses.
Each rater coded the sentence stems at separate times. The codes themselves signified categorization of nominal data; therefore inter-rater consistency was established using Cohen’s Kappa. After initial Kappas were determined for each set of codes, the raters discussed inconsistent codes, and came to agreement for each statement. Initial and revised Kappa values are reported in the next chapter.

The second question, *does the introduction of a performance task change students’ learning behaviors within a mastery oriented task*, was answered by comparing the strategy use and note taking of students across the two study conditions. Data from the surveys and sentence stems was also used to answer this second research question.

**Strategy Use Checklist**

To determine if in fact the deep processing and surface processing strategies emerged as separate scales, a preliminary factor analysis was used. Cronbach’s Alpha (α) was established for each to ensure the scales were reliable. Deep-processing strategies emerged as a separate construct with good reliability. This allowed them to be analyzed as a discreet construct, separate from overall strategy use.

Strategy use, both overall and deep-processing, was quantified by simply tallying the total number of strategies students reported using via the checklist.
Differences in total scores were then compared between the goal condition groups, as well as by students’ goal-based sentence stem responses through a series of t-tests.

**Note-Taking**

Assessment of notes was based on procedures from two previous studies. Each of those two studies considered different aspects of note taking, and this study has combined them to offer a more comprehensive view of students’ work. Notes taken by participants were coded for their *differentiation of information* and *coherence*. Differentiation measured students’ ability to distinguish between information that was relevant to the overall task, and information that was interesting but irrelevant. (Altemeier, Jones, Abbot, & Berninger, 2006) A score of two was given to notes that contained mostly relevant information. A score of one was given to notes that contained mostly interesting but irrelevant information.

Notes were also coded on a scale of 1-3 to measure their level of coherence. (Frey & Fisher, 2007; Peverly et al, 2007; Slotte & Lonka, 1999) Notes with a score of one were considered to be verbatim records of the words and phrases used in the book, and presented in the same order as the book or no order at all. Level two notes were those which are also presented in the same order as information in the book or no order at all, but they are translated into the
students' own words. This type of note taking is considered more locally coherent than the previous level because it shows evidence that students were able to summarize or transform the ideas presented in the text into their own language, but still lacks evidence that students were able to make connections between important ideas. Level three notes also showed evidence of translation, as well as being presented in meaningful categories, or with visual representations such as graphic organizers, or concept webs. This level of note taking shows the ability to summarize and to create logical connections and/or separations between the items in the text. Also contributing to this code would be self-generated headings for categories, which are evidence of higher-order structuring of information.

Finally, notes were given a quantitative score. This score was simply the total number of individual points of information recorded. For this measure, each separate fact was given one point. In the case of categorized lists, such as a list of all the animals in a particular biome, each list was considered one point of information.

Notes were coded by two raters. Each rater followed the same set of guidelines for the codes. The researcher was one of the raters; the other rater was a teacher familiar with this age group. Each rater coded the notes separately. Cohen's Kappa was used to establish consistency between the two raters.

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Following this analysis, any discrepancies were addressed through discussion until all notes received a single code from both raters. Results of the Kappa are presented in the next chapter.

As with the strategies, students’ scores for note taking were compared between the two goal condition groups, and based on students’ goal based sentence stem responses through a series of t-tests. This analysis looked for significant differences in note-taking scores based on condition group membership and self-reported goals.

Table 3.1 summarizes the way in which each source of data was analyzed in respect to the research question it was used to answer.

Table 3.1: Summary of Research Questions and Analysis

<table>
<thead>
<tr>
<th>Pre-Analysis Questions</th>
<th>Data Sources</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the goal condition affect students’ responses on the motivation sub-scales?</td>
<td>• Mastery and performance sub-scales</td>
<td>Descriptive Statistics for scales: • Mean • Standard Deviation • Estimated Cronbach’s Alpha (α) Inferential Statistics • Independent t-test to determine difference in mean sub-scale scores between the two conditions.</td>
</tr>
<tr>
<td>Are there significant differences in students’ amount of prior knowledge between the two conditions?</td>
<td>• Prior knowledge worksheet</td>
<td>Descriptive Statistics for Prior Knowledge • Mean • Standard Deviation Inferential Statistics • Independent t-test to determine difference in mean prior knowledge scores between the two conditions.</td>
</tr>
</tbody>
</table>
### Sub-Questions

**Research Question #1: Is **there stability in student motivation within and between tasks in a learning project?**

<table>
<thead>
<tr>
<th>Is there stability in students' self-reported goals and self-efficacy across the five surveys?</th>
<th>Achievement Goal Sub-Scales</th>
<th>Competence Sub-Scales</th>
</tr>
</thead>
</table>

**Descriptive Statistics for scales:**
- Mean
- Standard Deviation
- Estimated Cronbach’s Alpha (α)

**Inferential Statistics**
- Correlations (Pearson’s r) between mean scores on goal and efficacy sub-scales

<table>
<thead>
<tr>
<th>Is there stability in goals students report endorsing before the first and second tasks in a learning project?</th>
<th>Mastery Goal Sub-Scales</th>
<th>Goal Related Sentence Stems</th>
</tr>
</thead>
</table>

**Descriptive Statistics for scales:**
- Mean
- Standard Deviation
- Estimated Cronbach’s Alpha (α)

**Descriptive Statistics for sentence stems:**
- Goal Code: mastery / performance
- Frequency

**Inferential Statistics**
- Correlation (Pearson’s r) between Mastery goal sub-scale scores on before-task surveys.
- Chi Square test of independence for goal-related sentence stems.

**Research Question #2: Is students’ use of learning behaviors affected when a performance oriented task is introduced into a mastery oriented learning project?**

<table>
<thead>
<tr>
<th>Does the goal structure of the reading task relate to the learning behaviors that students use during reading?</th>
<th>Strategy Checklist</th>
<th>Notes</th>
</tr>
</thead>
</table>

**Descriptive Statistics for strategy checklist**
- Mean
- Standard Deviation
- Estimated Cronbach’s Alpha (α) for Deep-Processing Strategies

**Descriptive Statistics for Notes**
- Mean
- Standard Deviation

**Inferential Statistics**
- Independent t-test to compare mean strategy checklist scores
Do students’ responses on a self-report survey of achievement goals relate to use of learning behaviors during reading?

- Before Reading
  - Mastery and Performance Goal Sub-Scales
  - Strategy Checklist
  - Notes

Descriptive Statistics for Sub-Scales
- Mean
- Standard Deviation
- Estimated Cronbach’s Alpha (α)

Inferential Statistics
- Correlation (Pearson’s r) to compare strategy use to sub-scale mean scores.
- Correlation (Pearson’s r) to compare note scores to sub-scale mean scores.

Does the goal that students report endorsing via a sentence stem related to the learning behaviors that they use during reading?

- Goal Related Sentence Stems
- Strategy Checklist
- Notes

Descriptive Statistics for Sentence Stems
- Goal Code: mastery / performance
- Frequency

Descriptive Statistics for Strategy Checklist
- Mean
- Standard Deviation

Descriptive Statistics for Notes
- Mean
- Standard Deviation

Inferential Statistics
- One-way ANOVA to compare mean strategy scores between students based on the code of their goal-related sentence stems.
- One-way ANOVA to compare mean note score between students based on the code of their goal-related sentence stems.

Research Question #3: How do student’s outcome standards relate to their achievement goals and learning behaviors?

What is the relationship that students’ self-reported outcome

- Outcome Related Sentence Stems
- Achievement goal sub-scales
- Goal Related

Descriptive Statistics for Outcome-Related Sentence Stems:
- Outcome Code: Internal / External
- Frequency
standards have to their achievement goals and learning behaviors?

<table>
<thead>
<tr>
<th>Sentence Stems</th>
<th>Inferential Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chi Square test of independence between Outcome Standards for each task</td>
<td></td>
</tr>
<tr>
<td>• Chi Square test of independence between Outcome and Goal Related Sentence Stems</td>
<td></td>
</tr>
<tr>
<td>• Independent t-test to determine difference in mean achievement goal sub-scale scores based on Outcome Standard code.</td>
<td></td>
</tr>
</tbody>
</table>

**Summary**

The goal of this study is to better understand how motivation functions in a learning project; are there significant differences in students’ goals at different times during the project? Do students’ changing goals have an effect on strategy use? Through a series of self-report surveys about motivation, along with several other sources of data about achievement goals and strategy use, the data necessary to answer these questions has been collected and analyzed. The next chapter will present the findings from each of these analyses. In the final chapter, the interpretations and implications of those findings will be discussed.
CHAPTER FOUR

ANALYSIS OF INSTRUMENTS AND DATA

Introduction

This chapter will summarize the results of the statistical analyses used to answer the main research questions of this study. First, results from principal factor analysis and reliability testing related to the instruments used in data collection will be presented. Second will be the results from the statistical analyses used to answer the two main research questions of this study.

Factor Analysis and Reliability

Five-Part Motivation Survey

Each survey was developed to measure a number of elements relating to motivation. Each survey contained statements referring to mastery goals, performance goals, and self-efficacy. In order to ensure that these constructs were in fact present on the surveys, each was subjected to Exploratory Factor Analysis (EFA) which consisted of a principal components extraction with varimax rotation. For each survey, components were considered for inclusion if they had eigenvalues exceeding unity (1.00).
Reliability was assessed for each of the components that emerged from the factor analysis. For each survey, those components whose Cronbach’s alpha (\(\alpha\)) met or exceeded .65 were included in the final analysis. Two of the During Reading components and one Before Zoo component had alphas below .60. The remaining components had alphas of .65 or greater, with several exceeding .75. Based on Item-Total statistics, the decision was made to drop items from the scales as necessary to improve reliability. In each case where this was necessary, the deleted item was one which the researcher had not foreseen as loading significantly into the variable, suggesting that some of the statements were not as well understood by this group as they were by previous participants in the pilot studies.

The components that emerged on each scale and reached an acceptable Cronbach’s alpha for reliability were labeled based on the survey items from which they were comprised. On the Before Reading survey four components were found to have eigenvalues exceeding unity, accounting for 69.62% of the total variance and alphas exceeding .65. On the first survey, the four components that emerged were labeled mastery, performance, self-efficacy, and persistence. Persistence measured students’ intention to expend effort on the reading task. This fourth component was not anticipated in the original survey design, and did not appear on the remaining four scales.
Items that had separated into *mastery* and *self-efficacy* on the first scale overlapped on each of the four subsequent scales; this new construct was labeled *competence*. The During Reading survey revealed three components, totaling 64.33% of the total variance, but only one, *competence*, reached an acceptable alpha. The After Reading survey had only one component which accounted for 100% of the variance: *competence*. Performance failed to emerge as a reliable construct on any but the first survey; this issue has been found before in the validation of similar scales. (Midgley et al, 1998)

The first Before Zoo survey included four components which accounted for 69.51% of the variance. Only two of these reached acceptable alpha levels, *competence* and *group-efficacy*. The After Zoo survey had only two components with eigenvalues exceeding 1.00, explaining only 59.12% of the variance, of which only *group efficacy* reached an alpha above .65.

The fourth and fifth surveys had a construct labeled *group efficacy*. This scale consisted of questions about students' perceived efficacy for the group rather than at the individual level.

Table 4.1 shows a complete listing the reliable subscales that emerged from each survey, their related items, and Cronbach’s Alpha values. In subsequent analysis, these scales were treated as independent—not repeated measures—
because of the variations in sentence structure and different combinations of items included in each construct.

Table 4.1: Motivation Survey Subscales and Reliability

<table>
<thead>
<tr>
<th>Survey</th>
<th>Subscale</th>
<th>Statements</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Reading</td>
<td>Mastery</td>
<td>I want to learn a lot from this book.</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is a topic that I think is interesting.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I know that I will learn a lot from reading.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will know I did well if I feel like I learned something.</td>
<td></td>
</tr>
<tr>
<td>Reading Motivation</td>
<td>Performance</td>
<td>I will know I did well if I am the first one done.</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will only be happy if I do better than everyone else.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-Efficacy</td>
<td>I understand the directions for this task.</td>
<td>.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I think that this will be easy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am a good reader.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Persistence</td>
<td>It is important to me to understand what I read.</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Even if the book is difficult, I will try my best to read it.</td>
<td></td>
</tr>
<tr>
<td>During Reading</td>
<td>Competence</td>
<td>I feel like I am doing well on this assignment.</td>
<td>.75</td>
</tr>
<tr>
<td>Reading Motivation</td>
<td></td>
<td>So far, this book has been easy.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I have been learning a lot from reading.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>After reading, I will be able to talk about what I read.</td>
<td></td>
</tr>
<tr>
<td>After Reading</td>
<td>Competence</td>
<td>I feel like I reached the goal that I set for myself before reading.</td>
<td>.67</td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td>I learned a lot when I was reading</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I feel ready to do the next part of the project.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competence</td>
<td>I learned a lot from my book that will help me now.</td>
<td>.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It is okay if our zoo isn’t perfect on the first try.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>I will be able to help my group.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is an interesting project.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>All of the groups will make different zoos, and that will be interesting.</td>
<td></td>
</tr>
<tr>
<td>Before Zoo</td>
<td>Group Efficacy</td>
<td>I like that we are working as a group for this project.</td>
<td>.78</td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td>I think our group will do really well on this project.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group Efficacy</td>
<td>Our group did a good job.</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I thought about what I read when we were working on the zoo.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>We reached our goal as a group.</td>
<td></td>
</tr>
</tbody>
</table>
Strategy Use Checklist

The strategy checklist was intended to measure use of both deep-processing and surface-level processing strategies. In order to determine if different categories of strategies did in fact emerge on the checklist, it was tested using a principal factor analysis with varimax rotations. Six components emerged with eigenvalues exceeding unity (1.00), explaining 73.30% of the total variance, although rotation failed to find convergence. These four components were then tested for reliability. As predicted, items considered to be deep processing strategies loaded together, with a Cronbach’s alpha of .75 indicated good reliability on this scale.

Items in component two related to how students handled words or concepts they did not understand, labeled missing information (α = .66). The emergence of this particular component, and its relative reliability were not anticipated. Items seven, I skipped ahead in the book to see what was coming next, and twelve, I was reminded of other things that I know that were not in the book, loaded together to make up component three prior knowledge, but had very poor reliability (α=.03); it was unexpected that this component emerged separate from deep-processing strategies. Item seven was also related to component four, which was largely related to surface level processing strategies. Again, however, the reliability of this component was compromised (α = .35). Due to the large amount of cross-
correlation between the items on this scale, only the deep-processing sub-scale was included in the final analysis along with a mean score for strategy use in general.

**Sentence Stems**

The surveys administered before the reading task and before the zoo designing task included a set of sentence stems that were intended to collect data about students’ achievement goals and outcome standards on each task. Sentence stems were given a numeric code to represent categorical data. Purpose stems were coded as either mastery or performance, or a combination. Outcome standard stems were coded as either internal or external.

All stems were coded by two raters. Inter-rater reliability was established for the sentence stems and the notes that students took during reading. Cohen’s Kappa value was obtained for each set of scores, with inter-rater reliability reaching at least .77 prior to discussion between the two raters to bring all reliability to 1.00. Table 4.3 shows initial and then adjusted Kappas values for the four sentence stems.

**Note Taking**

Students were asked to take notes during reading. Notes were scored on two separate elements. First, notes were coded for their *differentiation* of relevant information from interesting but irrelevant knowledge; Cohen’s Kappa for this
reached .89. Second, coherence of notes was coded; Cohen’s Kappa for this was initially .77, improved to 1.00 after discussion between the two raters (mainly pertaining to checking students’ notes against the book’s text to determine whether or not statements were or were not verbatim). Finally, a score of quantity was assigned; one point was given for each individual fact or list of related items. The same procedure was followed for establishing inter-rater reliability for the notes taken by students.

**Potential Confounds**

Before beginning analysis to answer the main research questions of this study, it was necessary to ensure that there were no confounding factors based on students’ strategy experiences, prior knowledge of the topic during reading, or on the failure of the goal condition to be salient.

As there is no standard reading curriculum used in the elementary school where this study was conducted, it was necessary to ensure that students’ strategy use did not vary significantly based on their classroom. An ANOVA revealed no significant differences in strategy use depending on students’ classroom assignment.

Because prior knowledge is significantly related to reading outcomes, a t-test was used to ensure no significant difference could be detected between the two groups. Prior knowledge of students in the mastery condition (M=1.06, SD=.80)
was not significantly different from that of students in the performance condition (M=1.11, SD=1.20), t(35)=-.14, p=.88.

A Pearson’s correlation was used to measure the strength of the relationship between prior knowledge and students’ goals from the self-report survey. Mean score on the Before Reading Mastery survey sub-scale was not significantly correlated with prior knowledge, r(35)=.23, p=.23; nor was Before Reading Performance, r(35)=.25, =p.13.

An ANOVA was used to compare average prior knowledge scores based on the categories into which students’ sentence stem goals fell. This showed that the effect of the achievement goal was significant, F(2,3)=3.8, p=.03. Post hoc testing using the Tukey HSD criterion for significance indicated that the average amount of prior knowledge was significantly lower for students who reported a performance goal (M=.58, SD=.52) than those who reported a mastery goal (M=1.53, SD=1.07); it is unclear whether this finding is related to students’ actual prior knowledge or to their perception of the role of prior knowledge on a performance-oriented task.

It was also necessary to determine the relative strength of the condition goals before beginning analysis to answer the research questions. This was done by measuring the relationship the condition goals had to students’ survey scores
and the goals they reported on the sentence stems. Table 4.2 provides descriptive data for the survey sub-scales.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mastery Condition</th>
<th>Performance Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Before Reading Mastery</td>
<td>37</td>
<td>14.72</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>10.13</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>7.03</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>14.62</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>12.22</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td>14.60</td>
</tr>
<tr>
<td></td>
<td>37</td>
<td>6.93</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>6.87</td>
</tr>
</tbody>
</table>

A t-test was used to compare mean survey scores on the mastery and performance sub-scales between the two conditions. On the mastery subscale, no significant difference was found between students in the mastery condition (M=14.26, SD=2.20) and performance condition (M=13.32, SD=1.97), t(33)=1.36, p=.18. On the performance subscale, students in the performance
condition (M=3.84, SD=1.71) had a significantly higher score, on average, than students in the mastery condition (M=2.31, SD=1.35), t(33)=−3.02, p=.005. Table 4.3 summarizes these results.

<table>
<thead>
<tr>
<th>Sub-Scale</th>
<th>Mastery M</th>
<th>Mastery SD</th>
<th>Performance M</th>
<th>Performance SD</th>
<th>df</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Reading Mastery</td>
<td>14.26</td>
<td>2.20</td>
<td>13.33</td>
<td>1.97</td>
<td>35</td>
<td>1.36</td>
<td>0.18</td>
</tr>
<tr>
<td>Before Reading Performance</td>
<td>2.31</td>
<td>1.35</td>
<td>3.84</td>
<td>1.70</td>
<td>35</td>
<td>-</td>
<td>0.005</td>
</tr>
<tr>
<td>Before Reading Self-Efficacy</td>
<td>10.04</td>
<td>1.67</td>
<td>9.82</td>
<td>1.66</td>
<td>35</td>
<td>0.39</td>
<td>.70</td>
</tr>
<tr>
<td>Before Reading Effort</td>
<td>6.89</td>
<td>1.04</td>
<td>6.74</td>
<td>0.99</td>
<td>35</td>
<td>0.46</td>
<td>.65</td>
</tr>
<tr>
<td>During Reading Competence</td>
<td>14.71</td>
<td>1.18</td>
<td>13.64</td>
<td>2.77</td>
<td>34</td>
<td>1.45</td>
<td>.15</td>
</tr>
<tr>
<td>After Reading Competence</td>
<td>12.11</td>
<td>1.73</td>
<td>12.63</td>
<td>2.91</td>
<td>34</td>
<td>-</td>
<td>.52</td>
</tr>
<tr>
<td>Before Zoo Competence</td>
<td>14.59</td>
<td>1.22</td>
<td>13.95</td>
<td>2.27</td>
<td>34</td>
<td>1.04</td>
<td>.31</td>
</tr>
<tr>
<td>Before Zoo Group Efficacy</td>
<td>6.88</td>
<td>0.70</td>
<td>5.53</td>
<td>1.98</td>
<td>35</td>
<td>.77</td>
<td>.45</td>
</tr>
<tr>
<td>After Zoo Group Efficacy</td>
<td>6.88</td>
<td>0.70</td>
<td>5.53</td>
<td>1.98</td>
<td>33</td>
<td>2.67</td>
<td>.012*</td>
</tr>
</tbody>
</table>

An ANOVA was used to measure difference in students’ survey scores based on their goals reported via the sentence stems. Again, a performance orientation was associated with a significant difference in scores. Analysis, including a Tukey HSD post hoc test, showed that students who reported a performance goal on the sentence stems had an average score on the performance sub-scale of
the before reading survey (M=4.29, SD=1.94) that was significantly higher than students who reported a mastery goal (M=2.55, SD=1.42) or a mixed goal (M=2.44, SD=.98), F(2, 34)=5.43, p=.009. There was no difference in students' average scores on the mastery sub-scale associated with any of the three categories that emerged from the sentence stems. Finally, a chi-square test of independence was performed to assess the relationship between the goal condition and the goals that students reported in their sentence stems on the before-reading and before-zoo surveys.

A series of independent t-tests were used to compare components that emerged from the self-report survey scores between the mastery and the performance goal conditions. The only comparison that yielded significant results was between the mastery condition (M=6.882, SD=.70) and performance condition (M=5.53, SD=1.98) on the measure of After Zoo Group Efficacy, t(33) = 2.666, p=.01.

**Main Analysis**

Having completed these analyses, it was possible to address these two research questions:

1. Is motivation stable within and between two tasks in a multi-step learning project?
2. Does the introduction of a performance oriented task relate to students' strategy use during a mastery oriented learning project?

**Question One**

Based on the literature, it was hypothesized that students' achievement goals and self-efficacy may undergo some changes both within and across learning tasks. Evidence for both stability and change has been found in previous studies. In order to answer this question, goals and self-efficacy were compared across the five times at which they were measured in this study.

The sub-scales of the five surveys were not a true repeated measures design, and so an ANOVA could not be used to compare mean scores. Therefore, a Pearson's correlation was established between means on each of the sub-scales; a significant correlation was assumed to indicate stability while a lack of correlation indicated change. Results from the correlations are described here.

The first correlation revealed that scores from the mastery sub-scale were correlated with some, but not all, of the sub-scales from the five following surveys. Before Reading Mastery was significantly positively correlated with During Reading Competence, $r(35) = .51$, $p < .01$; although not with Before Zoo Competence, $r(34) = .28$, $p = .10$. During Reading Competence was, however, significantly positively correlated with Before Zoo Competence, $r(33) = .49$, $p = .003$. 

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Two sub-scales were present only on the first survey. Performance goals were reliable only before reading. Scores on the Before Reading Performance sub-scales could only be correlated with score from the Before Reading Mastery sub-scale. The correlation coefficient failed to reach significance, $r(35) = -.096$, although the negative trend does suggest that the two constructs were negatively related, as was found in previous studies. A second construct that emerged on the Before Reading survey that did not emerge on later surveys was Persistence. This scale included items referring to students' intentions to work hard, and persist on challenging items. This construct was significantly positively correlated with Before Reading Mastery, $r(35)=.48$, $p < .01$; and After Reading Competence, $r(34)=.49$, $p = .01$.

In addition to achievement goals, students' self-efficacy was measured at five times to assess stability. However, this component only existed independent of mastery goals on the first survey. On the four subsequent surveys, it was a part of competence. Like achievement goals, self-efficacy was significantly related across only a subset of the surveys. Before Reading Self-Efficacy was significantly positively correlated with During Reading Competence, $r(34) = .48$, $p < .01$, and Before Zoo Competence, $r(34)=.43$, $p < .01$, but was not significantly correlated with After Reading Competence, $r(34)= .32$, $p = .06$. However, After Reading Competence was significantly positively correlated with Before Reading
Mastery, r(34)= .45, p < .01; Before Reading Performance, r(34)= .41, p < .01; Before Reading Persistence, r(34)= .49, p < .01; During Reading Competence, r(33)= .58, p < .01; Before Zoo Competence, r(33)= .45, p < .01; and After Zoo Group-Efficacy, r(32)= .36, p < .01.

Efficacy was measured at the group level during the second task. Before Zoo Group Efficacy was significantly correlated only with Before Zoo Competence, r(34)= .38, p = .02. After Zoo Group Efficacy, on the other hand, was significantly positively correlated with Before Reading Mastery, r(33)= .37, p = .03; During Reading Competence, r(32)= .57, p < .001; After Reading Competence, r(32)= .36, p = .04; and Before Zoo Competence, r(32)= .37, p = .03.

Stems and Stability

A second set of analyses explored stability in students’ goals as reported through their sentence stem responses, administered before the reading task and before the zoo task. Frequency tables and bar charts were constructed for the goal categories into which students fell based on their sentence stems. Responses, and therefore students, fell into one of three goal categories: mastery, performance, and mixed (two competing goals reported by the use of a conjunction such as and/or/also).

Frequency tables revealed the number of students who fell into each of the three categories on the before reading sentence stems, and on the before zoo task.
stems. These results show a difference in achievement goals between the two tasks. On the zoo task sentence stems, more students' responses were coded as performance oriented than were in the reading sentence stems. Also on the zoo task, fewer students reported a combination of goals. Of the sentence stems referring to students' Before Reading Purpose, 34% were mastery, 24% were performance, and 16% were mixed. Of the sentence stems referring to the Before Zoo Purpose, 20% were mastery, 44% were performance, and 10% were mixed. In order to provide a preliminary idea of how students' goals were distributed for the two tasks, the two conditions were collapsed and the frequencies examined in aggregate; figures 4.1 and 4.2 show the distribution of sentence stems related to students' goals for the reading and zoo tasks in aggregate.

Figure 4.1: Aggregate Before Reading Goals as Reported via Sentence Stems.
Next, the frequency of each sentence stem response was examined between the two study conditions. Figures 4.3 and 4.4 show the distribution of goals within the mastery and performance conditions.
Figure 4.3 supports the finding from the survey data that the students in the performance condition were more likely to report endorsing a performance goal than the students in the mastery condition. This graph also shows that the majority of the mixed goals were generated by students in the performance condition.
Figure 4.4 shows the distribution of goals for the second task for each of the two study conditions. For this task, the majority of the students in the performance condition reported a performance goal, as did many more of the students from the mastery condition than had reported a performance goal for the reading task. This graph also shows that, unlike the reading task, students from the mastery condition reported the majority of mixed goals.
Summary

These findings suggest that some degree of change occurs between the tasks of a single learning project. Furthermore, it would seem that goals and efficacy are subject to change even within a single task, such as a reading assignment. The series of ANOVA, correlations, and frequencies reported here all show evidence to support the original hypothesis that motivation is not entirely stable within a multi-step learning project.

Question Two

In previous studies, it has been shown that learning projects are positively related to a mastery achievement goal orientation and to the increased use of learning behaviors. Research has not necessarily examined the strength of that goal or its benefits for learning when a performance oriented task is included in the project. In this study, students were divided into one of two conditions. In the performance condition, students were told that they would be taking a test after reading. It was hypothesized that these students would endorse a performance goal, and therefore use fewer or less adaptive strategies than students in the mastery condition. This hypothesis was tested by comparing students’ strategy use and note taking scores across the two conditions, based on students’ survey responses, and based on students’ sentence stem goals.
**Conditions**

A t-test was used to measure the difference in average number of strategies used between the study conditions. Results showed that there was no significant difference in the average number of reading strategies used by students in the mastery condition (\(M=10.44, SD=3.33\)) and those in the performance condition (\(M=8.95, SD=3.46\)) \(t(35)=1.34, p=.19\). A second t-test revealed no significant difference found in the mean number of deep processing strategies used between the mastery condition (\(M=5.29, SD=1.80\)) and performance condition (\(M=4.76, SD=2.51\)), \(t(35)=0.87, p=.39\). Three separate t-tests were used to compare students’ note taking scores across the two conditions as well, and found no significant differences.

Next, students’ strategy use and note taking were compared to their average scores on the self-report surveys. No significant relationship was found between before reading mastery \(r(35)=.11\) or performance \(r(35)=.24\) and the use of reading comprehension strategies; before reading self-efficacy was also not related to strategy use, \(r(35)=.24\). Scores on the before reading mastery, \(r(35)=.12\), performance \(r(35)=.27\), and self-efficacy, \(r(35)=.14\) sub-scales were also not significantly related to use of deep processing strategies. These results run counter to previous research which has predicted that a mastery oriented should have been significantly positively related to the use of strategies.
**Survey Goals**

Note taking behaviors were compared with students' average survey scores for the three before-reading sub-scales. No significant correlation was found between the two condition, although a positive correlation was found between the three elements on which the notes were scored; notes quantity was significantly correlated with both notes differentiation $r(35)=.41$, and notes coherence $r(35)=.38$.

**Sentence Stems**

Finally, an ANOVA was used to compare both mean strategy use and mean deep processing strategy use between students whose sentence stems responses were categorized as mastery, performance, or mixed. No significant difference was found in the average amount of strategies used by students in the three groups. There was a significant difference detected in the use of deep processing strategies. Post-hoc testing revealed that students whose stems were categorized as performance oriented ($M=3.85, SD=1.77$) used significantly fewer deep processing strategies than those students who reported mixed goals, ($M=6.18, SD=2.12$), $F(2,34)=3.51$, $p=.04$. There was no significant difference between the strategy use of students who reported a mastery goal and those who reported either a performance goal, or a mixed goal. An ANOVA was used to determine whether or not a significant difference existed on any of the three note
taking elements between the three achievement goal categories that emerged from the sentence stems.

**Summary**

Despite findings from previous research, the findings from this study did not show evidence that students used strategies differently depending on their goal orientation or goal condition. Multiple analyses failed to find a significant difference in strategy use or note taking between the two conditions. The only difference found was in the number of deep-processing strategies used by students whose reading goals were categorized as performance oriented and those students whose stems were categorized as mixed. Students who reported mixed goals via the sentence stems used significantly more deep-processing strategies than their performance oriented peers.

**Question Three**

This question was aimed at discovering what the outcome standards that students report via sentence stems can tell us about their goals for the task. There has been little investigation into the self-reported outcome standards or expectations that students have for themselves when they engage in academic tasks.

Students’ outcome standards were measured through sentence stems on the before reading and before zoo designing surveys, as were the goal orientation
sentence stems. Previous research has not included outcome standards as a variable; therefore the data collected here was treated as pilot data, and subjected to exploratory analysis only. It was hypothesized that outcome-standards would have a significant relationship with students’ achievement goals. Specifically, it was anticipated that students who endorsed a mastery goal would also endorse an internal outcome standard, while performance oriented students would endorse an external outcome standard.

Each stem response was coded as either internal or external. Internal responses referred to a feeling, quality, or behavior that stemmed from the student. External responses, on the other hand, mentioned qualities or products separate from the student. Descriptive statistics are included in Table 4.4.

Table 4.4: Outcome Standards Descriptive Statistics.

<table>
<thead>
<tr>
<th>Stem</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I will know I did a good job reading if...</td>
<td>37</td>
<td>1.43</td>
<td>0.51</td>
</tr>
<tr>
<td>I will know I did a good job if...</td>
<td>37</td>
<td>1.19</td>
<td>0.40</td>
</tr>
</tbody>
</table>

For the reading task, internal standards included responses such as: “...I read slowly and thoroughly;” “...I learn something, feel satisfied, and have tried my hardest with the book;” and “I have the feeling that I did a good job in my gut.” On these, and other internal, responses students made explicit mention of their
level of effort, of a feeling of accomplishment, and a sense of having learned new material. Contrast these responses with those coded as external: "...I finish all the questions;" "...if I get a lot of things right;" and "...I do good on the project." In each of these cases, the emphasis is on some "other." Grades and peers are both external to the learner; any response that made mention of these two concepts was coded as external.

The internal and external codes for the zoo project were similar to those for the reading project. Again, any reference to an object, person, or benchmark outside the learner was coded as external. For example, "...other groups like our work;" "...I do it neat and take my time on it;" and "...I finish first." In each of these examples, goal achievement is connected to an external point of reference. On the other hand, internal codes were given to statements that refer to personal accomplishment without mention of any external or tangible points of comparison. For example, "...I take my time;" "...I like what I did;" and "...I put all my effort in this project."

One way to understand the standards that students identified for evaluating their own outcomes was through a frequency table. It was found that students' outcome standards shifted between the two tasks. The two graphs below (Figures 4.3 and 4.4) show the frequency of responses before the reading and zoo
tasks in aggregate. As the charts depict, there was a large difference in students' outcome standards between the first and second tasks.

Figure 4.5: Aggregate Before Reading Outcome Standards as Reported via Sentence Stems.
In order to better understand the pattern of outcome standards, the frequencies were analyzed by study condition. Figure 4.7 shows the distribution of outcome standards by condition for the reading task. Overall, the majority of students identified internal outcome standards. A nearly even number of students identified each standard, with only slightly more students from the mastery condition identifying an external outcome standard. That is inconsistent with the hypothesized distribution of outcome standards.
Figure 4.7: Before Reading Standard by Study Condition

![Graph showing the count of participants in different conditions before reading the standard.

Figure 4.8: Before Zoo Standard by Study Condition

![Graph showing the count of participants in different conditions before the zoo standard.

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Figure 4.8 also shows the distribution of outcome standards by study condition; this chart shows the frequency of each standard for the zoo building task. The aggregated data showed a move towards an external outcome standard for this task. Figure 4.8 reveals that while the distribution from both conditions did change for this second task, the change is much more pronounced for those students who were assigned to the performance condition.

Finally, the distribution of students' outcome standards was measured by dividing students not by their study condition but by the goals they had reported for each task on the before-task sentence stems. Figure 4.9 shows the distribution of students' outcome standards based on their before-reading goals.

Figure 4.9: Before Reading Standard by Before Reading Goal
An independent t-test measured the difference in average scores for the Before Reading Mastery and Before Reading Performance sub-scales based on reported outcome standards. There was no statistically significant difference between students' average scores on either sub-scale based on their outcome standards for either task. Table 4.5 summarizes the results.
### Table 4.5: Summary of Outcome Standards T-tests by Goal Condition.

<table>
<thead>
<tr>
<th>Before Reading</th>
<th>Standard</th>
<th>Before Reading Mastery</th>
<th>Internal</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>T</th>
<th>External</th>
<th>7</th>
<th>14.50</th>
<th>2.10</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>13.62</td>
<td>2.12</td>
<td>-1.0</td>
<td>21</td>
<td>4.06</td>
<td>2.26</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td></td>
<td></td>
<td>30</td>
<td>3.08</td>
<td>1.68</td>
<td>-.08</td>
<td>21</td>
<td>2.86</td>
<td>1.42</td>
<td>-.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Since one area of interest in this study was learning behaviors, an independent t-test was used to determine if there was a significant difference between students' reported strategy use based on their before-reading outcome standards. The t-test revealed no significant difference in strategy use overall, \( t(35)=1.325 \) for students who reported an internal standard (\( M=10.03, SD=3.39 \)) versus those who reported an external standard (\( M=8.14, SD=3.44 \)). Likewise, students with an internal standard (\( M=5.18, SD=2.14 \)) and those who reported an external standard (\( M=4.59, SD=2.50 \)) were not significantly different in their use of deep processing strategies, \( t(35)=.64 \). This same analysis was used to determine if note taking behaviors might differ significantly between students who reported different before reading standards for achievement. A t-test
revealed no significant difference on note taking scores based on outcome standards.

**Summary**

The outcome-standard sentence stems were included for exploratory purposes. Literature on achievement goals has referenced outcomes yet has not measured them systematically. The findings from this study suggest that they are an area that needs to be explored further, because the relationship expected based on previous literature was not found to exist between outcomes and goals or learning behaviors. Although the findings here cannot be statistically proven, the exploratory, descriptive data that is available indicates a relationship worth additional investigation.

**Summary**

Before the two main research questions of this study could be addressed, it was necessary to measure the influence of students' prior knowledge about the topics they were assigned, and to calculate the impact of the task conditions. Next, the two main research questions of this study were answered through the analysis of numerous sub-questions that each provided important information. Finally, exploratory analysis addressed a third, tertiary research question about the role of students’ outcome standards. The next chapter will reflect on the interpretations and implications of these findings. Any study, no matter how
interesting the findings, can be improved; therefore, the next chapter will also address limitations faced by this study, and potential directions for future research.
CHAPTER FIVE

DISCUSSION AND IMPLICATIONS OF RESULTS

Introduction

This study asked and answered three research questions drawn from Wigfield’s (1997) conceptualization of the questions by which learners prepare themselves for academic tasks. In order to better understand how students answer the questions “Can I succeed?” and “Do I want to and why?” the first research question explored stability in students’ situated self-efficacy and achievement goals during a learning project. Findings suggest only partial evidence of instability in self-efficacy and goals within and between related academic tasks. The second research question drew from the third question that learners ask themselves: “What do I need to do to succeed?” The effect of introducing a performance goal structure into a mastery oriented project on students’ strategy use was measured, and a difference in deep-processing strategies was found, although only when students’ goals were measured through the sentence stem completion task.

The third research question of this study was intended to measure the utility of adding a fourth question to Wigfield’s framework: “How will I know if I have
succeeded?” To that end, this study included an initial exploration of the outcome standards that students conceptualize as the end point of their achievement goals. These outcome standards were captured through the use of a sentence stem completion task, a method not typically employed in studies of achievement goals. The inclusion of this method is responsible for the most interesting implications of this study, and helps to explain findings from the first two research questions.

This chapter will explore these findings in relation to previous literature in this area, and will discuss their implications for practice and future research. Three important points surfaced through interpretation of the findings. First, there seems to be a conceptual difference between agreement with an achievement goal and endorsement of that goal. Second, a multiple goal perspective best explains students’ responses and behaviors within the learning project framework. Third, additional research is necessary to uncover the relationship that outcome standards have with achievement goals and learning behaviors for self-regulated learners.

Findings

Stability and Change in Achievement Goals

Previous literature on achievement goal stability has found that while dispositional goals tend to be stable, particularly within academic domains,
situational achievement goals are less stable. In longitudinal studies, students' goal orientations have been shown to change as they progress through a school year or college course. Typically, previous studies have found that students become more performance oriented over time. (Meece & Miller, 2001; Fryer & Elliot, 2007; Senko & Harackiewicz, 2005; Jagacinski, 2010) However, the majority of these studies were set in college classrooms, an environment that has been shown to be particularly amenable to a performance approach goal orientation. For this study, a mastery goal structure was introduced through the design of the learning design. To elicit situated motivation, students were asked to focus their survey responses on the task in which they were immediately involved. It was hypothesized that students' achievement goals would be strongly mastery oriented due to the project based framework. (Bell, 2010; Guthrie et al, 2004; Hart & Albarracin, 2009; Hidi & Harackiewicz, 2000; Meyer, Turner, & Spencer, 1997) Given the two goal conditions, instability was anticipated only for those students in the performance condition, who were expected to shift to a mastery orientation for the second task, based on the presumed goal structure of learning projects.

Results were inconsistent with the hypothesized outcomes. As expected, achievement goals were not stable between the two tasks. However, rather than a move toward a mastery orientation, students' responses showed a clear move
away from a mastery goal and toward a performance goal for the second task. Specifically, measurement of students' achievement goals through the sentence stem completion task indicated that students became more performance oriented, despite the mastery goal structure that was intended by the project.

The sentence completion task provided an additional source of data about students' achievement goals, and supported the interpretation that goals were not automatically transferred from one task to the next. On each of the two tasks, students' responses were coded as mastery, performance, or mixed. Before reading mastery goals included sentence ends such as “...to have fun and learn;” “...to learn more interesting facts about the forest and learn more about reading;” and “...to try and get better at my reading skills and learn something new.” Conversely, performance oriented sentence ends included responses that were based on grades, such as “...I am reading for the test” or on teacher-approval, “...to help a teacher in college.” Teacher approval was considered to be a performance orientation after a lengthy discussion between the researcher and two fourth grade teachers. It was decided that students who are concerned with the teacher's agenda are indirectly seeking to demonstrate their ability to do what the teacher wants, as opposed to being concerned with their own learning. Other students reported mixed achievement goals; the statements included “...to build a zoo and learn more about the rainforest;” and “...to learn about the
grasslands and also to do my zoo project.” These responses were coded as mixed because students mentioned both developing and demonstrating competence. For the reading project, students reported a mastery goal more frequently than a performance or mixed goal.

This was not the case for the zoo building task. These goal-focused sentence ends were more frequently performance oriented, with very few students reporting a mastery or mixed goal. The majority of performance oriented responses focused on the zoo task itself. For example, many students wrote “...to make a good zoo” or “...to do very well and make a neat finished product.” In both of these examples, students are focused on their demonstration of learning via their artifact. On the other hand, students whose responses were coded as mastery orientated focused on their own or their group’s effort as the goal; “...to learn more and help the other people in my group;” and to work together and learn something about animals’ habitats and we will have fun” were both considered mastery goals. Finally, a small number of students reported a mixed goal orientation, such as “...to make it neat and understandable and everyone in the group works hard on it;” and “...to finish it well and have fun.” One possible explanation for this finding has to do with the nature of project learning tasks. Learning projects require both self- and collective-efficacy, as there are both individual and group tasks. Traditionally,
the inclusion of a group task is considered to support students’ motivation because it provides an opportunity for social interaction. (Bell, 2010; Deci, 2000) However, as efficacy and goals are related, it is possible that the switch from self-efficacy on the reading task to collective-efficacy on the zoo task is in some way related to the shift from a mastery goal to a performance goal. More sophisticated analysis of this relationship should be a part of future research.

Another element of project learning is the creation of an artifact which demonstrates what has been learned. (Bell, 2010; Blumenfeld et al, 1991; Meyer, Turner, & Spencer, 1997) It makes sense that students would focus their goals and behaviors on this artifact since the role of the artifact is to demonstrate what has been gained through the learning process. Additional research is necessary, but this shift also suggests that students are able to adopt multiple goals within a single learning project.

One possible explanation for the lack of differentiation between performance and mastery oriented students, the first survey notwithstanding, is the nature of the overall project. All students, in both conditions, knew from the beginning that they would be completing a two part project in which they needed to learn about animals and their habitats, and then would work in groups to create a model of a zoo. The project itself was specifically designed to be motivating in that the topic was interesting, the two tasks fit together in an authentic manner,
and the students were allowed to work collaboratively on the zoo model. Furthermore, at no time other than in the initial directions for those students in the performance condition was assessment mentioned. Together, these traits of the project should have worked to make it inherently mastery oriented. The directions emphasized students' learning, and the note taking space was adjacent to the space where students were asked to record their prior knowledge—making their learning very tangible and obvious. For these reasons, it is very likely that the students in this group adopted a default mastery orientation and their use of learning behaviors, and their survey and stem responses were a direct result of that, rather than of the directions.

Within the reading tasks, goals were stable, but self-efficacy before reading was not correlated with self-efficacy after reading, despite a strong during reading correlation in both directions. This implies that students' perceptions of themselves before beginning a task are not necessarily the same perceptions they will have after the task. As suggested in previous research, this instability in self-efficacy can be explained by task familiarity. (Fryer & Elliot, 2007; Jagacinski, Kumar, Boe, Lam, &Miller, 2010; Meece & Miller, 2001; Sanko & Harackiewicz, 2005) Before engagement, students may estimate their goals, particularly for a novel task such as this. As they engage with the task, they become familiar with the demands of it. This allows them to make more accurate reports of their self-
efficacy, accounting for the instability seen in the self-report survey results within the reading task. This could also be explained as the difference between anticipation and self-reflection, which are two very different processes. Before beginning the reading task, students were anticipating what the project would be like, imagining what their responsibilities and responses would be, and reported their self-efficacy based on this anticipation. Upon completing the reading, students were reflecting on their effort, engagement, and sense of ability as it developed over the course of the reading task. The lack of correlation between the two most likely represents a difference in anticipated efficacy and students’ reflection on their efficacy.

In terms of practical implications, this would suggest that bolstering students’ self-efficacy before a task in the hopes of encouraging them to choose a mastery goal may not be as effective of an approach as waiting until they have already become engaged in the task. The pattern of gradual change from before reading to after reading self-efficacy shows a difference in students’ feelings about the reading process before they begin and once they are involved in it. It suggests that students need to be actively involved in a process, such as reading before they can accurately assess their sense of efficacy for the task. Previous research has linked changes in achievement goals to changes in self-efficacy. (Jagacinski et al, 2010; Meece & Miller, 2001) A next logical question would be to investigate
whether students' self-efficacy for a second reading task would correlate with their after-reading self-efficacy from the first reading task, and if their achievement goals for the second reading task would show signs of instability.

**Differences in Students' Strategy Use**

A related body of literature has looked specifically at the relationship between achievement goals and learning behaviors. It has suggested that students who are mastery approach oriented will use more learning strategies overall, and a greater number of deep-processing strategies specifically, during reading. (Entwistle & Ramsden, 1982; Guthrie et al, 2004; Schraw, Horn, Thorndike-Christ, & Bruning, 1995) Situated mastery approach goals can be promoted through instructional practices. For this reason educators often use project learning to enhance strategic reading. What has not been determined in previous studies is if the introduction of an overtly performance oriented task would undermine students' strategy use. Interestingly, the only evidence of a different pattern of learning behaviors came when strategy use was compared between groups of students who had identified mastery, performance, or mixed goals on the sentence stem completion task. Those students who had reported a performance goal for the reading task used significantly fewer deep-processing strategies than students who reported either a mastery or a mixed goal, just as the literature would have predicted. What was surprising about this finding,
however, comes from the distribution of goals between students in the two study conditions. As was seen in Figure 4.3, slightly less than twice as many students from the performance condition reported a mixed goal than from the mastery condition. This suggests that students' self-identified goals, rather than the goal condition itself, may have a stronger relationship to strategy use.

The statistically significant difference on deep-processing strategies does suggest that the students who reported a performance goal used less optimal goals than their mastery oriented peers. However, the two groups used the same number of strategies on average, and took equally well-scored notes. Given the lack of relationship between strategy use and note taking, it seems that a possible next direction for research about goals and learning behaviors is to look more closely at note-taking. There is very little in the existing literature about studying students' note-taking from any perspective, but particularly little from the field of AGT. Typically, researchers have assessed learning outcomes through standardized or normative measures, rather than through the artifacts that students create.

One way to understand this contradiction is by accepting that students can hold multiple goals simultaneously, and react to them in a hierarchical manner. This could be evidence for two of the four multiple goal theories put forth by Barron and Harackiewicz (2001). The additive goal hypothesis states that when
students endorse both a mastery and a performance goal simultaneously, each goal has a separate, positive effect on a single academic outcome. In relation to the findings of this study, it would suggest that students used deep-processing strategies equally well for different underlying reasons. A second explanation comes from the selective goal hypothesis. This suggests that when students have to choose between the multiple goals they endorse, they do so based on the immediate situation, and their understanding of which goal will be most adaptive. Additional research would be necessary to determine which of these two hypotheses most closely explains the findings from this study. However, the subtle changes in achievement goals suggest that the selective goal hypothesis may be more viable in this situation.

Based on a concern that the introduction of a test or quiz might be enough to skew students’ achievement goals, this study specifically examined the goals of students who either were or were not told they would be given a quiz to measure their comprehension. As the t-test results showed, students who were told they would have a quiz did report significantly more feelings of a performance orientation that those students who were not told there would be a quiz. These findings suggest that students are in fact acutely in tune with the directions for a task, and will choose their goals according to the form of assessment they expect to follow their reading. However, the groups were not
significantly different in their level of mastery orientation on each of the surveys, and had a statistically similar level of self-efficacy on the first survey. Because performance failed to emerge as a reliable construct across the five surveys, it is impossible to say if significant differences might have been found between the two groups' surveys beyond the one administered before the reading task. It is also impossible to say whether a performance goal would have followed the same pattern as a mastery goal, changing throughout the course of the reading task.

**Student-Set Outcome Standards**

There has been very little investigation into the outcome standards that students conceptualize for themselves in relation to their achievement goals. In this study, outcome standards were measured with a sentence stem completion task that specifically attached outcomes to the goals that students endorsed, also measured by sentence stems. The data was analyzed through descriptive statistics, mainly frequencies. Initial findings suggest that this is an area of goal research that deserves more attention. Literature describing mastery and performance goals would suggest that outcomes standards closely align with achievement goals such that students who endorse a mastery goal would measure goal attainment internally, while students with a performance goal would measure attainment via an external source. The limited exploratory
analysis here indicates the relationship is more complex than originally hypothesized. This is particularly true for the reading task, where outcome standards did not show the same pattern of distribution as achievement goals. Before reading, there was a far more even division between students who endorsed either a mastery or a performance goal, with a small percentage endorsing both. The outcome standards were weighted heavily, however, towards an internal outcome standard. Interestingly, for the zoo task many students reported endorsing a performance goal, and the split between internal and external standards was almost evenly divided. This seems to suggest that although many students reported endorsing a performance goal for the reading task, their frame of reference was still within themselves for the zoo task. This raises an important question: is there a difference between students' agreement with goals and their actual endorsement of them?

It is possible that the move towards external standards and performance goals has simply to do with the fact that there was a product that students would be creating. One piece of project-based learning is students' use of their knowledge to create an artifact. (Bell, 2010; Blumenfeld et al, 1991; Meyer, Turner, & Spencer, 1997) Typically, project-based learning assignments are mastery oriented, with the product or artifact being used as a way for students to showcase their knowledge about a subject rather than a way to grade or compare
students’ work. Based on this, there are two possible directions in which the sentence stems can be interpreted. One possible interpretation is that project-based learning is not entirely mastery oriented and the introduction of the artifact forces students to think about the learning project as a means to an end. A second, and more likely, interpretation has to do with students’ perceptions of the role of the artifact, and the weakness of a two-category system for coding the outcome standard stems.

The stems were coded only for internal and external outcomes without making distinctions within those categories. Internal standards of success on the zoo were recorded in responses such as “I put in effort,” “I feel good about the project,” and “I take my time.” These students focused on affective dimensions; not on the actual artifact, only on how they would need to feel about it. On the other hand, students who reported external standards focused on more concrete standards. For the zoo task, external standards can be seen in responses such as “… It’s cool and neat;” “People can understand my map;” and “… I finish first.” A more careful inspection of the categories within those responses coded as external revealed that students made a distinction between doing well on the zoo (a product orientation) without reference to peers, while others specifically referred to doing “better” than others (a competitive orientation). This distinction between competence and competition is an important one. It
indicates that students had two different interpretations of the purpose of the artifact. Some students interpreted the artifact as being a point of comparison against the other groups, such as in the statement “...if the other groups like our work.” Others interpreted the artifact as being indicative of their learning, as is the intention in a project-based learning assignment. These students wrote outcome standards that had to with a sense of pride or accomplishment in their artifact, such as “…if the zoo is neat and done well.” In this study, these two types of external responses were not coded separately; future research should actively investigate the subtle differences between these types of outcome standards. In order to do this effectively, many more subjects will be necessary, and a Grounded Theory methodology may be more appropriate.

There was also a distinction between internal and external outcome standards evident in students’ outcome standards for the reading task. Internal goals for reading were evident in responses such as “…if I read slowly,” “…if I feel satisfied and tried my hardest,” and “…if I have fun.” External outcomes for reading were very rare. The few responses that were categorized as external included “…if I get a lot of things right;” “…I am the last one done;” “…I do good on the project;” and “…I finish all the questions.” Like the outcome standards for the zoo building task, the external standards here can be further divided into comparison-oriented and artifact-oriented.
This pattern of outcome standards raises an important question about students’ reported goals, both from the stems and from the surveys before reading. The survey data showed that those students in the performance condition reported a stronger performance goal without a significant decline in their mastery goals. The sentence stems also showed that the instructions were strongly endorsed by students in the performance condition. The outcome standards that students reported, however, do not suggest that these students had in fact internalized a performance orientation. This may be a case of agreement without endorsement; it is possible that, having heard the directions, students reported on the goals they thought the researcher wanted them to endorse. It suggests that while students acknowledge goal structures, they may not act on them. This may be particularly true of internal tasks, such as reading, where self-reference is the most logical point of reference. Future research should investigate this finding in other academic domains with varying degrees of external validation for students. This seems to align with the findings that students’ outcome standards shifted to an external point of reference for the zoo task. Unlike the reading task, the zoo task offered a tangible, external product that students could use to assess their competence. Additional research should focus on outcome standards, and specifically investigate the cognitive process by which students chose a reference point for their goal achievement.
Another plausible explanation is that the students in this study are not yet adept at conceptualizing their outcome standards in a way that is consistent with their goals. In addition to goal setting and behavior management, a significant part of self-regulated learning is self-reflection after a task. (Ablard & Lipshultz, 1998; Cleary & Zimmerman, 2004) Each of these phases must be directed at a specific aim, an end point that each is directed towards. Often, the end point is assumed by the nature of the task; in classrooms, outcome standards are predetermined through an assignment. Finishing a chapter or a worksheet, completing a task to the assignment’s specifications, these are predetermined outcome standards. In a task such as reading, an outcome or end point may be more challenging to identify. Indeed, reading teachers encourage students to see reading as something more than simply getting to the end of the book. In such an example, what is the end point? In a learning project where there are multiple tasks, how do students understand the outcome? Do they see the final endpoint as being the final product, or can they identify a series of outcome standards for each task? Additional research about students’ outcome standards should focus on how they choose them, particularly for tasks such as reading that do not have a tangible end point.

The overwhelming sense that this data analysis imparts is that students saw the reading task and the zoo building task as inherently different. There was no
correlation between students’ achievement goals for the two tasks. The goals and outcome standards that the students expressed through their sentence stems on the reading task were, statistically, independent from their goals and outcomes on the zoo designing task. This separation makes sense, given the nature of each task. Reading is a largely invisible process, without tangible markers of success. For such a task, it makes sense that students would choose goals and outcome standards which are also internal, and largely “invisible” to an observer. In the zoo designing task, the process is oriented towards a tangible object that represents students’ goal attainment on the first task. For the second task, it makes sense that students’ focus would move outward toward that object. As it is a representation of mental processes, however, it also makes sense that the object can become the students’ focal point without diminishing the mastery orientation from which it stems, explaining the difficult to detect differences in students’ strategy use.

Summary

There are three important implications of these findings. The first developed from the inconsistent report of goals across the surveys and sentence stems, and the outcome standards that students set for themselves. It would seem that there needs to be a distinction between goal agreement and goal endorsement. Each of the students responded to the self-report survey in a way that was consistent
with their agreement with the goal structure for their task condition. The students in the performance condition scored, on average, significantly higher than their mastery condition peers on the before reading performance subscale. However, the division of goals on the sentence stems, and the preferences for internal outcome standards suggest that students did not endorse the goal with which they had so strongly indicated agreement.

A second implication from the findings of this study is that when motivational stability is measured, self-efficacy and achievement goals must be measured separately. It would seem that self-efficacy may be subject to instability during a task, while achievement goals fluctuate between tasks, even tasks that are related such as those within a learning project. This means that future researchers should look closely at individual tasks to understand the point at which students are able to best determine their self-efficacy. This knowledge would then be helpful for classroom teachers as they help their students to develop self-regulation skills. Furthermore, future studies of academic success from the AGT framework should look more closely at how students shift goals between tasks. This particular viewpoint may shed important new light on the multiple goal perspective, and the role of performance approach goals in academic success.
The final implication of these findings is that additional research needs to be done on students’ self-selected outcome standards. Additional research on outcome standards could significantly add to the current understanding of achievement goals. At this point, there is very little research looking at how students conceptualize their own success in terms of goal attainment. It is assumed that when students report endorsing a particular achievement goal, they envision attainment in the same manner as the researchers. Based on the literature describing the 2x2 achievement goal framework (Baranik, Stanley et al, 2010; Elliot & McGregor, 2001; Hulleman et al, 2010) there are four possible goals students can adopt for an academic task. Each goal is defined by a set of beliefs and behaviors, and students’ goals are quantified by measuring their agreement with statements that define each of these goal orientations.

**Implications of Findings**

**Sentence Stem Completion Method**

The findings from both sets of sentences stems are of particular interest here. The majority of studies measuring achievement goals have relied on self-report surveys. However, sentence stem completion tasks are a common method employed by psychological and behavioral researchers. Including them in this study represents a new direction for achievement goal research. They were included in the hope that by putting their intended outcomes into their own
language, students will report an authentic goal and outcome standard, rather than just indicating agreement to those imposed by the goal structure.

In this study, mastery goals were the majority, but there was also a significant percentage of students who reported a performance goal, and even a percentage who reported endorsing both goals simultaneously. This is not inconsistent with the results of the self-report surveys. The division among goals on the before-reading sentence stems shows a similar distribution to that intended by the goal conditions, providing support for the assumption that goal structure is salient to students, and will influence their goal endorsement. (Ames, 1992; He, 2005, 2008; Kaplan, Middleton, Urdan, & Midgley, 2002; Wolters, 2004) The lack of a correlation between average scores on the before-reading and before-zoo mastery goal subscales is corroborated by the dispersal of sentence stem goals. There is a significant shift away from a mastery orientation and towards a performance orientation for the zoo task. Again, there were a small percentage of the participants who reported endorsing both goals simultaneously, but the overwhelming majority of responses indicate a unqualified difference in achievement goals between the two tasks.

The debate about the merit of performance goals in academic settings is one of the biggest questions in AGT research right now. It has not been settled with this study, but perhaps the inclusion of the sentence-stem completion tasks may
add to the discussion in one important way. One of the ways in which the inconsistent findings have been explained is by pointing out the contextual nature of the findings. Previous research has suggested that performance goals can be adaptive in the right situation. (Baranik, Barron et al, 2010; Elliot, McGregor, & Gable, 1999; Horowitz, 2010) Students must learn to recognize the appropriate situations and endorse goals accordingly. This ability has been described both as self-regulated learning and as a multiple goal perspective. The results of the sentence stem completion task for both goals and outcome standards weigh heavily in favor of this interpretation. The responses indicate that students are able to hold multiple goals simultaneously, and that the goals they choose to endorse are dependent upon the learning context, as shown in the shift in achievement goals between the two tasks. The inclusion of the sentence stem completion task, and the responses that it generates, may help future AGT researchers to better conceptualize how students interpret their goal orientations in relation to real-world outcomes.

Outcome standards then add to this by offering insight into how students envision the results of their goal oriented behavior. Although most students reported a performance goal for the zoo building task, many of them continued to endorse an internal outcome standard for that task. This internal standard
seems somewhat at odds with a performance goal orientation, suggesting that students may have more than one goal for each task.

It is important for future research to think about, if not explicitly measure, students’ outcome standards for a task. Understanding the standards by which students will assess their own goal attainment adds an important dimension to understand why they may have adopted a particular goal orientation in the first place. It would seem that students’ outcome standards offer insight into how learners interpret the purpose of a task and the processes and products related to it. One important piece of insight that can be gained from understanding students’ outcome standards is a sense of what counts as learning to students. While teachers may have standards in mind when they create assignments, it does not necessarily follow that students will be working towards the same outcomes. This is especially true for learning tasks that do not culminate in a tangible product, such as reading. In such an activity, it is important to understand not only what students’ goals are, but also how they will determine if and when they have achieved them.

Additional research should be done employing the sentence-stem completion method to capture data about students’ achievement goals and outcome standards for academic tasks. An important next step for introducing sentence stems into the AGT research methodological is to carefully evaluate their validity.
and reliability in relation to already established instruments. One way to do this would be to compare the achievement goals of students as measured by either a self-report survey or the sentence completion task, to determine if the two methods are comparable. Data collected through sentence stems will need to be analyzed using more sophisticated statistical measures than those used here. With larger, independent groups of students, a chi square test may be an appropriate way to analyze this type of data. Even with more advanced analysis, understanding the validity and reliability of the outcome standards will be more difficult, as there is not a pre-established method in the AGT for measuring this construct.

**Practice**

For teachers, there are practical implications of these findings. This study used a learning project as its framework because previous research on learning projects has shown them to be positively related to adaptive academic goals and strategy use. Projects share a number of common features which proved to be of particular interest in interpreting the results of this study, specifically: the endorsement of a learning goal, the use of multiple tasks, the focus on strategic reading, and the production of an artifact to represent learning.

The relative stability of students' mastery orientation on the self-report surveys, even in the face of a strong performance oriented response to the initial
task directions in the performance condition, suggests that it is possible to imbed performance oriented tasks within larger, mastery oriented projects without compromising students' sense of learning as a goal. Instead, it suggests that project learning can enhance a multiple goal perspective, allowing students to work towards more than one goal simultaneously. This is also indicated by the shift in goals between the two tasks.

A second common trait in project learning is the use of multiple, related tasks. The findings from this study point towards a multiple goal orientation, which may be enhanced in a learning project. Multiple goals are believed to help students be more able learners, particularly when they are able to direct their goal use to specific tasks and for specific outcomes. (Barron & Harackiewicz, 2000; Hart & Albarracin, 2009; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Kaplan, Middleton, Urdan, & Midgley, 2002) The findings from this study suggest that students will view those tasks as being directed by unique goals, not as all falling under a single goal orientation. As teachers continue to use project learning to enhance academic goal setting, they should be aware that students will need to manage multiple goals. This ability to manage goals effectively falls under the heading of self-regulated learning. (Cleary & Zimmerman, 2004) Students who are self-regulated learners are capable of understanding the context of a task, developing a goal to match that context, and then directing
behaviors towards that goal. In a learning project, there will be multiple, layered contexts to understand. Students may benefit significantly from instruction on how to make decisions about and to set goals within a project.

Another of the common practices in project-oriented learning is a focus on strategic reading. Some instructional programs specifically include strategy instruction, to help students make the connection between strategic reading and the learning process. (Bell, 2010; Frank & Barzilai, 2004; Guthrie et al, 2004; Meyer, Turner, & Spencer, 1997) In this study, students were not taught by the researcher to use strategies before engaging in the reading task, but they still did use them. Although there was a difference detected in students’ strategy use based on the achievement goal they reported endorsing through the sentence stems, there was no relationship between strategy use and other measures of motivation. Despite these inconclusive results, including strategy instruction, and emphasizing its importance during a project, should remain a necessary component of project learning. In addition to the strategies traditionally emphasized in reading instruction, note taking skills should also be explicitly taught as an important skill for a learning project. Note making plays an important role in the learning process; when students are proficient note takers, not simply copiers of information, they are actively transforming information into personal understanding. (Frey & Fisher, 2007) Furthermore, notes provide
students with a tangible resource that they can return to as they progress through the learning project. Having such a resource may help to increase students' sense of efficacy for later tasks in a project, and may offer students multiple opportunities to increase their comprehension of the text. Both of these hypotheses should be explored in future research.

A final characteristic of project learning is the creation of an artifact. The findings from this study suggest that there are practical implications for the inclusion of an artifact in a learning project, as evidenced by the shift in students' achievement goals between the two tasks, and by the pattern of outcome standards that emerged. It had been anticipated that students would be more mastery oriented during the zoo building task, yet this was not the case. Given the nature of the learning tasks, and the creation of a learning artifact, it seems logical in hindsight that students would come to endorse a performance goal for their artifacts. Naturally, students want their work, especially work which represents their learning, to be well constructed and well received by peers and teachers. In order to direct behaviors to this sort of end, students will need to endorse a type of performance goal. What becomes imperative for instruction is that teachers are able to help students differentiate between tasks requiring mastery and performance goals, and to help students maintain an approach
valence for all tasks. It will be up to teachers to help students to learn about the nature of different academic tasks, and the appropriate goals for success.

Perhaps the most important implications for instruction come from the outcome standards that students reported for both the reading and the zoo building tasks. For the reading task, students tended to endorse a strong internal outcome standard far more than they endorsed an external standard. This makes sense in relation to the type of task that reading is—an internal one. However, for the zoo building task, students’ shift toward a performance goal was not mirrored in an equal shift towards an external frame of reference. It seems important for accurate self-reflection that goals and their outcomes align. Instruction should focus not only on helping students to set achievement goals appropriate for the tasks they wish to accomplish, but also to help students understand what standards of success are appropriate for reflection and self-assessment.

It would be very easy for teachers to begin working achievement goals and outcome standards into their classrooms. This study used several pre-existing instructional strategies, such as the prior-knowledge and note-taking worksheet, which was closely based on a KWL chart. This or any of the other graphic organizers available and widely used in classrooms today provide an opportunity to help students focus on their goals and outcome standards. These
are study guides intended to help students plan and visualize their learning during reading; it seems logical to attach goals and outcome standards to this process. For example, after completing the second box of a KWL chart, which is where students write their main questions for reading, teachers could have students reflect on why they want to answer these particular questions and how they are going to know they have done their best work. In answering these two simple questions, students are establishing their goals for the reading task, and outlining a set of criteria for judging their goal attainment. By incorporating the sentence stem completion task with a graphic organizer students will create a visual representation not only of their knowledge but also of their goals and outcome standards as well. Like any form of self-regulated learning, proficiency with completing the sentence stems will take explicit instruction and practice. However, research continues to show that emphasizing a mastery approach orientation and self-regulation for learning leads to academic success.

**Future Research**

For researchers, the results suggest that it is necessary to rethink the time at which students' motivation for reading tasks is measured, especially their self-efficacy. Rather than measuring these constructs before a task begins, motivation must also be monitored throughout the learning activity, and beyond to capture the subtle shifts that occur as students settle into the reading processes, become
familiar with the text. In truth, given the findings here and those from previous studies, it would seem that the most accurate time at which to measure students’ motivation is after they have already begun a task. This way, students have time to become familiar with the task demands, and to accurately reflect on their goals and sense of efficacy for completing the task.

The findings from this study present multiple opportunities for future research. Stemming from the first two research questions are possibilities for additional studies more closely examining students’ ability to shift between achievement goals as they shift between related tasks, and the changes in behavior that accompany those shifts. The five part motivation survey used in this study can and should be refined, but it promises to be a useful tool for researchers interested in changes in motivation between tasks. A true repeated-measures version of the survey could offer better insight into the stability of students’ achievement goals throughout a project. In continuing to investigate goal stability within the framework of a project, future researchers should also look at more complex learning projects and should include measures of motivation for all of the tasks included. In this study, only two of the four different tasks assigned to students were used for data collection. Had each of the four tasks been used, a more complete picture of goal stability would have emerged.
A second direction for future research, stemming from this study, is to further investigate the relationship between students' survey answers and their sentence stem answers. In this study, only two stems were presented to students before the reading and then before the zoo designing tasks. These two small sets of stems revealed an unexpected pattern of goals and achievement standards. Furthermore, these patterns did not necessarily match the goals that students' survey responses revealed. Why this might be is a necessary next question. Did students perceive the surveys as being inherently different than the sentence stems? Are students of this age not aware enough of their own motivations to accurately reflect them via the sentence stems? The findings from this exploratory study only suggest that there is more to know about this topic, but cannot make guesses as to what the answers to these questions might be.

Future research could also look at why the students in this study did not show the anticipated pattern of strategy use based on their goals. As stated above, there are two possible explanations. One is an underlying mastery orientation throughout the sample which could be addressed through the use of both a general survey assessing motivation for academic tasks and the within-task surveys used here. The second possible explanation is that the goal structure of the project buffered students from behaving in a performance oriented manner while reading. This seems likely given findings from research.
on project-based learning, which has been shown to strengthen mastery goals. Additional survey questions asking students about their perceptions of the task goals may help to clarify this issue.

If the findings were caused by an underlying disposition in the students, then additional studies should reveal the anticipated pattern of learning behaviors. If, however, the difference comes from some inherent goal structure of the project, this has important implications for classroom teachers. Despite the performance condition scoring significantly higher on the performance subscale of the first survey, they also had high scores on the mastery subscale and behaved just as the mastery condition students did on the reading and zoo designing tasks. For teachers, uncovering the root of this similarity would allow them to find a way to give students inherently performance oriented tasks without negating any mastery orientation they have built into the larger classroom ethos. Such a finding would also confirm, at a more micro level, the claims of problem-based learning that it protects students' interest in learning and personal understanding.

Finally, the addition of a measure of epistemology could strengthen the findings and implications of this study. Underlying a reader's beliefs about her role in reading are her beliefs about intelligence and knowledge in general, and how intelligence is related to natural ability and effort. (Braten, 2008; Dweck &
In general, there are two ways in which individuals view intelligence. An entity view of intelligence refers to the belief that it is a fixed aspect of a person that cannot be altered through instruction or effort; either you have it or you do not; this is related to a transmission model of reading. On the other hand, an incremental view of intelligence defines it as something that is created over time, through experience, instruction, and effort. Intellect, from this view, is something that any individual is capable of creating through the right set of circumstances and effortful engagement, related to a transaction model of reading.

Students’ beliefs about the relationship ability and effort have to intelligence are particularly influential to their use of strategies. In some cases, effort is seen as the opposite of ability: if one has to expend effort to complete a task, it is because she does not possess natural ability (Dweck & Leggett, 1988; Elliot, 1999; Linnenbrink & Pintrich, 2002; Nicholls, 1984; Nolen, 1988; Weiner, 2000); ability is seen as something innate, not something you create over time. These readers are less likely to use deep-processing strategies, instead engaging only with the surface level of the text. Others believe that ability can be developed through directed effort; effortful engagement in challenging tasks leads to increasing proficiency. For these readers, deep processing strategies will be a necessary component of feeling a sense of engagement and competence.
There were several limitations to this study. The most obvious limitation was the sample size. A participant pool of only 37 may not have been enough to detect underlying differences across the population or to prevent erroneous findings from emerging. Initially, a sample size of 50 or more was anticipated. Five separate elementary schools were contacted for participation in this study. All five schools were within the same school district, and the same town. Only one school agreed to participate. This was due to the conflict with MCAS testing in the spring, as well as school projects, field trips, and special events. The school that did agree to participate was the largest of the five schools, offering an opportunity to get close to 50 participants. A total of 80 letters of invitation were distributed by the fourth grade teachers, and 45 students returned signed slips granting them permission to participate. Of those 45, 37 were present on both days of work and actively participated in both sessions. Although this number is below the anticipated number of participants, it is still an acceptable number for exploratory statistical analysis.

One way in which more subjects could have been added to the sample pool was by contacting additional elementary schools. Although this would have increased the number of participants, it could have introduced a number of confounds into the study. By stepping outside of a single school district, it
would have been necessary to control for a host of factors. Although all schools in Massachusetts work towards a state-wide set of standards, there is no way to control for individual differences in the curriculum between school districts. In truth, even working with multiple schools in a single district would not have ensured continuity in the reading curriculum for all fourth graders. Another problem with reaching beyond a single school district would be substantial differences in socio-economic status. Massachusetts is very economically diverse, with pockets of wealth and poverty scattered around the state. Finding a second school that had an equitable average measure of SES, or including instruments to account for differences in SES could have significantly hindered the timeline of this study, forcing it to run into a second school year.

The most important change would be to include a much larger number of participants from a variety of backgrounds. This would require a number of additional measures to be included in the study. Specifically, in order to control for differences in students not from the same school or school district, independent measures of academic motivation, and academic achievement should be included to ensure homogeneity within the participant population. In a larger sample size, it would also be possible to include students from different grade levels. If this were the case, it may be necessary to include developmental
measures of motivation and epistemology, as these are traits known to change within subjects.

The inability to randomly assign students to each of the two conditions was also a limiting factor in this study. Due to scheduling conflicts, a lack of space in the school building, and the uneven distribution of students who returned permission slips from the five classrooms, it was impossible to randomly assign students to conditions. Instead, classroom groups had to be kept intact for this study. Although analyses were conducted to ensure that the students from each classroom were not significantly different in their prior knowledge or strategy use, the quasi-experimental design still limits the depth of interpretation that can be made from this data. Future studies should strive for a truly experimental design with random assignment to goal conditions.

Another limiting factor in this study was time. Due to conflicts with MCAS preparation and testing, and then with school-related activities, the students were not available to participate until the end of the school year. Both groups met with the researcher on the second to last and last weeks of school, following the official “Fourth Grade Graduation” ceremony. Each time, the groups met in the school cafeteria, which is much larger than a regular classroom, and is adjacent to the music room. Although in each of the groups the students appeared focused and engaged in their work, it is impossible to say that they
would have acted in exactly the same way at any other time of the school year, or in a different location. It is also difficult, because of the time of the year, to accurately portray this subject pool as “fourth graders” since they had already been moved-up for fifth grade via the school ceremony. Although they were not actually fifth graders at the time, they may have seen themselves as fifth graders, which could have had an impact on their choice of behaviors all around.

In this study, students were only given one hour for each of the two sessions. This time constraint was imposed by the circumstances; the school year was a significantly limiting factor, as was the amount of time classroom teachers were willing to allow their students to miss from daily instruction. A future rendition of this study should allow far more time for students to work. It is recommended, in fact, that at least three separate sessions be allotted. The first session should be extended beyond one hour, so that all students have time to finish the reading and note taking without rushing, as well as completing the first three surveys. The application task should then be broken into two separate sessions, to allow students maximum time to reflect on their reading, plan their zoo, and the complete the zoo building project. In this study, the limit of one hour prevented all of the groups from completing the entire zoo model

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1 It is not recommended that the reading task be split up over two separate sessions if the surveys are to be used as the same (before, during, after) time points. Any break within the reading task could skew the survey results, as motivation and self-efficacy may change in the intervening period. If necessary, students should be given an extended time period and told the may take short breaks as needed.
project, which was unfortunate. It is especially problematic since many students reported their finished product (the zoo) as an important indicator of their success/goal achievement. Not having a sense of completion may have skewed the after-zoo survey responses.

A major limitation of this study was the instrumentation. The surveys that were administered were created by the researcher, based on the statements included in previous, published studies of motivation and goal orientation. The surveys were piloted with other fourth grade students, although the group of students involved in the pilot study was too small for sophisticated statistical analysis. As a result, the constructs and scales that emerged from each survey, and the reliability of each of those scales, was not necessarily anticipated. While each of the constructs that was intended did emerge, they were not all reliable or distinct. The conflation of mastery goals and self-efficacy beginning with the second survey did not allow for a particularly sensitive analysis of either of these two constructs. The failure of the performance goal scales to reach acceptable Cronbach’s alphas for reliability was also a shortcoming for the analysis. This collapse of constructs could be why a strong series of correlations was not found. The fact that mastery and self-efficacy became confounded in surveys two through four suggests that there is not enough of a difference between these two scales to separate them statistically.
Elements of academic motivation such as achievement goals are usually measured using self-report surveys. Like any concept measured through self-report, there is always a danger that participants will be hesitant to answer honestly, choosing to stick closely to social norms or what they think the researcher wants to hear. This problem can be alleviated by using multiple statements about each concept being measured, each worded in a different way. Some researchers have found it helpful to include negatively loaded statements as well, although other researchers have found that these statements are confusing for participants, and often need to be excluded from the final data analysis. For this study, it was decided that no negatively loaded statements would be included, which significantly reduced the overall number of statements. It is unclear if this, or the wording of the statements themselves, was responsible for the collapse of mastery goals and self-efficacy on four of the five surveys.

The survey was also somewhat limited by its failure to be a true repeated measures design. Since the statements on each survey were not identical, they could not be treated as repeated measures, narrowing the possibilities of analysis and potential for interpretation. Since the scales were not identical, the only method of analyzing differences in the survey results was through correlation. Although the results of the correlations do indicate that something shifts over the
course of the reading task, and between the reading and zoo tasks, it is impossible to say what that shift actually is. A t-test or ANOVA would have been possible via a repeated measures design, which would have been a good indicator of the underlying cause of the failure of some of the constructs to correlate. Future research should seek to develop more appropriate methods for measuring changes in achievement goals and self-efficacy during task engagement. Such an instrument would have to be carefully designed, piloted, and revised in order to be truly repeated measures.

One of the biggest challenges of this study was finding language for each survey statement that reflected the appropriate construct, partly because it is difficult to get at the same idea from three separate time-based view points. Inherent in a before-during-after design is the passage of time, which is reflected in the wording of the statements. For this reason, any future usage of these surveys which hopes to be repeated measures will have to pay special attention to the language used in each statement, to balance reliability and validity with chronology.

Further work with this research design should also strive to find a repeated measure that is appropriate for students' motivation within reading and between the reading and application tasks. The easiest, and perhaps most important, change that could be made to this study would be to increase the
amount of time that students have to work on each of the two tasks. From these limitations stem potential pathways for additional research. This study was primarily exploratory in nature, with the hope of uncovering new directions. Of particular interest is the continuing investigation into the changing nature of motivation, specifically goals and self-efficacy, within reading and other learning tasks. From the correlations found in this study, it seems an important avenue of investigation for the future. If the premise suggested here—that motivation shifts in subtle but important ways within a single task—is in fact true, it is something that researchers and teachers should know more about. More sensitive instruments, as described above, could uncover more about the nature of these shifts: how they truly unfold across the learning event, whether they unfold in the same way for all students, and what might cause those shifts.

Summary

Despite the limitations imposed by time, a small subject pool, and a new instrument, this study provides many new directions for research. Future studies in this area should concentrate on understanding how self-efficacy and achievement goals are impacted by participation in a multi-task learning project. The interplay of tasks leading to the creation of an artifact to represent learning is a particular situation of learning and should be examined as such, just as non-project based learning must be examined as its own unique situation. Additional
research should also be aimed at investigating how particular combinations of mastery and performance oriented tasks within a learning project may influence students' use of learning strategies. Finally, this study has shown that future research should focus on the ways in which students conceptualize their success by looking more closely at their goal outcome standards.

There are also implications for practice that can be derived from the findings of this study. As teachers work to support students' motivation in the classroom, they should consider how tasks relate to one another, and how these interactions will affect goals and self-efficacy. Particularly important here is the implication that a multiple goal perspective is likely to emerge within a learning project. Educators must take care to emphasize the appropriateness of matching goals to a task. One way this can be done is by explicitly introducing the setting of both a goal and an outcome standard before task engagement begins. This practice can be connected to any of a number of already existing methods for supporting self-regulated learning.

**Conclusion**

This study aimed to add to the existing understanding of students' achievement goals and learning behaviors in three ways. Previous research has found that self-efficacy and goals change over large periods of time, and in reaction to significant transitions. This study looked for evidence of instability in
self-efficacy and goals during the periods of transition within and between related academic tasks. Although additional research is necessary to explicate the findings, there is reason to believe that students actively reevaluate their self-efficacy and goals as task parameters change.

This is related to the second objective of this study, which was to investigate the effect of introducing a performance oriented goal structure into a traditionally mastery oriented task. Project learning has become a popular instructional method for helping students to develop mastery goals and adaptive learning behaviors. Projects include group work, multiple related tasks, an emphasis on learning, personal creativity, and the production of an authentic artifact to represent learning. These are all thought to help improve students' situated academic motivation, and to hopefully support the development of more long-lasting dispositional academic motivation. Based on research that has linked performance goals with less adaptive learning behaviors, it was hypothesized that introducing a normative assessment into a learning project would diminish some of the adaptive behaviors displayed by students. The findings were inconsistent, and relied heavily on the methods by which achievement goals were measured. Future research should return to this question with more refined instruments. It is possible that differentiating between goal agreement and goal endorsement as separate constructs is
necessary to fully understand the relationship that achievement goals, goal structure, and learning behaviors have with one another within the context of a learning project.

This study also introduced two elements not previously included in achievement goal research: goal outcome standards, and a sentence completion task. Each added to the literature in its own way. Although outcome standards are assumed to be important to achievement goal beliefs, they have not been systematically investigated in previous literature. This study chose to include them in data collection in order to explore their utility for future research. Outcome standards were defined as the end point or marker by which students believed they could evaluate their success on a task. Students were asked about their outcome standards for both the reading task and the zoo task, and the results yielded some interesting implications. It had been hypothesized, based on the definitions of mastery and performance approach goals, that students would cite an internal outcome standard when they endorsed a mastery goal, and would cite an external outcome standard when they endorsed a performance goal. The results, however, did not show such a straight-forward relationship. Instead, goals and outcome standards show evidence of a more complex association. Future studies using more sophisticated statistical measures may be
able to uncover more about the nature of this relationship, and the variation that seems to exist in it.

The inclusion of the sentence stem completion task also provides a new direction for achievement goal research. Traditionally, goals are measured through self-report surveys. Sentence completion tasks, however, have been used in psychological research and clinical practice for many years, and have shown validity and reliability in those settings. This particular method was paired with a more traditional self-report survey in this study to examine their validity in an achievement goal context. They were found to be closely associated with the survey results, indicating they can be appropriate for use in studies measuring achievement goals. Furthermore, the sentence stem completion task validated the inference from the survey findings that a careful separation of goal agreement and goal endorsement is necessary when it was determined that only the sentence stems were able to explain a difference in students’ deep-processing strategy use. Future studies should continue to work to establish validity of the sentence stem completion task for measuring achievement goals, as well as working to better understand how students’ responses on the stems coordinate with their responses on more traditional self-report surveys.
As with any contemporary research using the achievement goal framework, this study was acutely aware of the inconsistent relationship between performance goals and student achievement. Although this study did not consider achievement as a variable, it was still able to add somewhat to the debate about performance goals, though the inclusion of outcome standards as a variable. Based on the initial results of this study, students who report endorsing a performance goal may not necessarily do so at the cost of an internal outcome standard. This can be understood as supporting a multiple goal hypothesis, which has been described as a particularly adaptive goal stance. Additional research on the relationship between performance goals and achievement that specifically includes a measure of students' outcome goals may be the pathway for ending this debate.

As with any study, this one faced limitations and challenges. The three research questions posed were answered within the confines of the design and data. The findings that have been drawn from the data are open to alternative interpretations, and they may not hold up through future studies. Despite these seeming hindrances, this study did meet its one main goal, which was to push towards a new direction in achievement goal research as it relates to academic settings and the use of learning behaviors. By reframing old questions, and introducing a new variable and method, this study has been able to present a
number of questions, which offer fresh possibilities for future research; it has been able to make suggestions for practice which may help educators to better meet the motivational needs of their students and put them on the path to a more positive relationship with learning. Ultimately, research is like any learning task; it is a process of moving towards a goal of understanding and only through constant reevaluation of the process can real learning take place.
LITERATURE CITED


Bresciani, M.J., Oakleaf, M., Kolkhorst, F., Nebeker, C., Barlow, J., Duncan, K., & Hickmott, J. (2009). Examining design and inter-rater reliability of a rubric


Middleton, M. & Perks, K. () The enactment of mastery goals for secondary student writing: a sociocultural approach to achievement goal theory.


APPENDICES
Appendix A: Institutional Review Board Approval

University of New Hampshire
Research Integrity Services, Service Building
51 College Road, Durham, NH 03824-3585
Fax: 603-862-3564

27-Jan-2011

Kortz, Kirsten
Education, Morrill Hall
319 Highland Ave, #1
Somerville, MA 02144

IRB #: 4769
Study: The impact of task goals on reading strategy use and academic motivation
Review Level: Expedited
Approval Expiration Date: 02-Feb-2012

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved your request for time extension for this study. Approval for this study expires on the date indicated above. At the end of the approval period you will be asked to submit a report with regard to the involvement of human subjects. If your study is still active, you may apply for extension of IRB approval through this office.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, Responsibilities of Directors of Research Studies Involving Human Subjects. This document is available at http://www.unh.edu/osr/compliance/irb.html or from me.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-203 or julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,

Julie F. Simpson
Director

cc: File
    Middleton, Michael
The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Expedited as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 110 with the following comment(s):

Before starting the study in a site, the researcher needs to forward to the IRB for the file a copy of the parental consent letter signed by the principal.

Approval is granted to conduct your study as described in your protocol for one year from the approval date above. At the end of the approval date you will be asked to submit a report with regard to the involvement of human subjects in this study. If your study is still active, you may request an extension of IRB approval.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, Responsibilities of Directors of Research Studies Involving Human Subjects. (This document is also available at http://www.unh.edu/osr/compliance/irb.html.) Please read this document carefully before commencing your work involving human subjects.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,
Julie F. Simpson
Manager

cc: File
Ciolfi, Grant
Appendix B: Instruments

B1: Five Part Motivation Survey

Before Reading Survey

Please circle a number that tells me how well you think each sentence below describes how you are feeling right now, about the reading that you are about to do.

1 - I don't feel this way at all. 2 - I mostly don't feel this way. 3 - I am not sure how I feel about this sentence. 4 - I mostly feel this way. 5 - I definitely feel this way.

1. I understand the directions for this task. 1 2 3 4 5
2. I want to learn a lot from this book. 1 2 3 4 5
3. I think that this will be easy. 1 2 3 4 5
4. I am a good reader. 1 2 3 4 5
5. I will know I did well if I am the first one done. 1 2 3 4 5
6. This is a topic that I think is interesting. 1 2 3 4 5
7. I will only be happy if I do better than everyone else. 1 2 3 4 5
8. It is important to me to understand what I read. 1 2 3 4 5
9. I know that I will learn a lot from reading. 1 2 3 4 5
10. Even if the book is difficult, I will try my best to read it. 1 2 3 4 5
11. I will know I did well if I feel like I learned something. 1 2 3 4 5
12. It is okay to make some mistakes as long as I keep trying. 1 2 3 4 5

In my own words, my purpose for reading this book is:

________________________________________________________________________________
________________________________________________________________________________

I will know that I did a good job reading if:

________________________________________________________________________________
________________________________________________________________________________

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During Reading Survey

Please circle a number that tells me how well you think each sentence below describes how you are feeling right now, about the reading you about to do.

1 - I don't feel this way at all.  2 - I mostly don't feel this way.  3 - I am not sure how I feel about this sentence.  4 - I mostly feel this way.  5 - I definitely feel this way.

1. I remember the directions for this task.  1 2 3 4 5
2. I feel like I am doing well on this assignment.  1 2 3 4 5
3. So far, this book has been easy.  1 2 3 4 5
4. I will only be happy if I do better than everyone else.  1 2 3 4 5
5. I have not been trying very hard on this project.  1 2 3 4 5
6. It is important to me to be the first one done.  1 2 3 4 5
7. I have been learning a lot from reading.  1 2 3 4 5
8. I want to do well on this part of the project.  1 2 3 4 5
9. After reading, I will be able to talk about what I read.  1 2 3 4 5

After Reading Survey

Please look back at what you wrote down as your goal for reading this book (what you wanted to accomplish). Circle the number that best represents how well this sentence describes how you are feeling right now.

1. I feel like I reached the goal that I set for myself before reading.  1 2 3 4 5
2. I learned a lot when I was reading.  1 2 3 4 5
3. I think that I did better than anyone else.  1 2 3 4 5
4. I feel ready to do the next part of the project.  1 2 3 4 5
**Before-Zoo Survey**

Please circle a number that tells me how well you think each sentence below describes how you are feeling right now, about the project that you are about to do.

1 – I don’t feel this way at all. 2 – I mostly don’t feel this way. 3 – I am not sure how I feel about this sentence. 4 – I mostly feel this way. 5 – I definitely feel this way.

1. I want to finish our zoo before any of the other groups. 1 2 3 4 5
2. I learned a lot from my book that will help me now. 1 2 3 4 5
3. It is okay if our zoo isn’t perfect on the first try—we can fix anything. 1 2 3 4 5
4. I will be able to help my group. 1 2 3 4 5
5. This is an interesting project. 1 2 3 4 5
6. I will learn even more about this from working on the zoo project. 1 2 3 4 5
7. All of the groups will make different zoos, and that will be interesting. 1 2 3 4 5
8. There is one best way to make the zoo. 1 2 3 4 5
9. I like that we are working as a group for this project. 1 2 3 4 5
10. I think our group will do really well on this project. 1 2 3 4 5

In my own words, my goal for this project is:

__________________________________________________________________________

__________________________________________________________________________

I will know that I did a good job if:

__________________________________________________________________________

__________________________________________________________________________
**After-Zoo Survey**

Please circle a number that tells me how well you think each sentence below describes how you are feeling right now, about the project that you just completed.

1 – I don’t feel this way at all.  2 – I mostly don’t feel this way.  3 – I am not sure how I feel about this sentence.  4 – I mostly feel this way.  5 – I definitely feel this way.

1. Our group did a good job. 1 2 3 4 5
2. I used the information I read about to help my group. 1 2 3 4 5
3. There are other ways to do the zoo, but I like what we did. 1 2 3 4 5
4. I thought about what I read when we were working on the zoo. 1 2 3 4 5
5. We reached our goal as a group. 1 2 3 4 5
6. I should have read more carefully, because I could not remember much from the book. 1 2 3 4 5
B2: Reading Strategy Checklist

Reading Strategies Checklist

Please put a check next to any of the strategies listed below that you used while you were reading to help you better understand the information:

Before reading I...

__ Looked through the book for pictures or charts.

During reading I...

__ Went back and reread things that did not make sense
__ Used the pictures, charts, and graphs to help me understand the words
__ Looked up or asked about words that I did not know
__ Saw pictures in my mind of what I was reading about
__ Took notes in my own words, to help me understand better
__ Stopped occasionally to make sure I understood what I was reading
__ Skipped ahead in the book to see what was coming next
__ Made connections to other stuff I know about this topic
__ Looked for the most important details in each section
__ Read some things that I did not know before
__ Tried to memorize the facts
__ Was reminded of other things that I know that were not in the book
__ Figured out the answers to my questions
__ Wrote down exactly what the book said in my notes
__ Skipped over things that did not make sense.

After reading I...

__ Went back and reread some parts of the book
__ Made sure that I understood everything I read
__ Looked at the notes that I took while reading, to make sure they made sense to me.
B3: Prior Knowledge and Note-Taking Worksheet

What I already know about this topic: Notes: (use the back if you need more room)
B4: Biome Worksheets

Tropical Rainforests

A. Please write a definition for each of these words:

   Biome
   Emergent Layer
   Canopy
   Understory Layer

B. Please answer these questions:

   1. What is the climate like in the rain forest?
   2. Where on Earth would you find a rain forest?
   3. What kinds of things can people use from the rain forest?
   4. How many layers does a rain forest have? What are they?
   5. What are some animals that live in the rain forest?
   6. Why is the rain forest in trouble?
   7. How do plants and animals work together in the rain forest?
   8. What is it like on the forest floor?

C. Draw a diagram of the four layers of the rain forest and give an example of the animals that live in each layer.
The Tundra

A. Please write a definition for each of these words:

   Biome
   Arctic Circle
   Permafrost
   Migrate

B. Please answer these questions:

   1. What is the climate like in the Tundra?
   2. Where on Earth would you find the Tundra?
   3. Why is the Tundra in trouble?
   4. What can people use from the Tundra?
   5. How do animals survive the winters in the Tundra?
   6. How do insects like mosquitoes survive the winter?
   7. What is special about the Tundra in the summer?

C. Draw a picture comparing the Tundra in winter and in summer, including examples of animals that live there during each season.
Deciduous Forests

A. Please write a definition for each of these words:

Deciduous
Biome
Canopy
Hibernate

B. Please answer these questions:

1. What is the climate like in a deciduous forest?
2. Where on Earth could you find a deciduous forest?
3. What kinds of things can people use from the forest?
4. How are deciduous forests in trouble?
5. How do plants and animals work together in the deciduous forest?
6. How many layers does the forest have? What are the layers?
7. What animals can you find in a deciduous forest?
8. What kinds of plants would you find in a deciduous forest?

C. Draw a picture of the layers of the deciduous forest, and include examples of the animals that would live in each layer.
The Grasslands

A. Please write a definition for each of these words:
   Biome
   Prairie
   Savannah
   Preserve

B. Please answer these questions:
   1. What is the climate like in a temperate grassland?
   2. What is the climate like in a tropical grassland?
   3. Where on Earth might you find grasslands?
   4. How have people changed the grasslands in Africa and America?
   5. What kinds of animals might you find in the grasslands of Africa?
   6. What kinds of animals might you find in the American prairie?
   7. What prevents trees from growing in the grasslands?
   8. Why doesn’t the grass die during winters or fires?

C. Draw a picture of each of the two types of grasslands, showing how they are the same and how they are different.
Deserts

A. Please write a definition for each of these words:
   Biome
   Caravans
   Evaporate
   Cactus

B. Please answer these questions:

   1. What is the climate like in the desert?
   2. Where are some of the Earth’s deserts located?
   3. How do desert plants like the cactus survive?
   4. Where do desert animals find water?
   5. At what time of day is the desert the most active? Why is this?
   6. Why do you need to be careful of the plants and animals when visiting the desert?
   7. In what ways are humans harming the deserts in America?
   8. What are some of the animals that you might find living in the desert?

C. Please draw a picture of the desert showing where water can be found, where animals make their homes, and the important plants.
B5: Zoo Planning Worksheet

Directions for Zoo Builders:

Name of biome / region: ____________________________

On the map, please color in any parts of the world where you might find this biome.

What is the weather / climate like there:

How is this different from the weather in Natick?

How can you build your area of the zoo to address these differences? (Will you need special buildings?)

From the list, what animals, plants, or insects should live in your biome?

Can all of the animals in your biome live together? How will you separate them?

What do you want people to learn about this biome when they visit your zoo?
Animals, Plants, and Insects:

**Animals**
- Bears (brown, black, polar)
- Deer
- Howler monkeys
- Fox (red, arctic)
- Raccoons
- Caribou
- Wolves
- Bats
- Coyotes
- Fennec foxes
- Kangaroo rats
- Spider monkeys
- Mice
- Sloths
- Prairie dogs
- Jaguars
- Cheetahs
- Elephants
- Gazelles
- Snowshoe hares
- Meerkats
- Zebras

**Birds**
- cardinals
- robins
- finches
- arctic turns
- ptarmigans

**Plants**
- maple trees
- oak trees
- arctic willows
- violets
- moss

**Reptiles and Amphibians**
- parrots
- snowy owls
- cactus wrens
- gila woodpeckers
- macaws
- roadrunners
- hawks
- toucans
- eagles

**Insects**
- beetles
- spiders
- butterflies
- ants
- deer flies
- termites
- mosquitoes
- arctic bumblebees
- honey bees
- black widow spiders
- scorpions
- tarantulas

**Other**
- arctic poppies
- lichen
- cactus
- spinifex grasses
- blueberries
- raspberry bushes
- elephant grass
- orchids
- sunflowers
- yuccas
- joshua trees
- rubber trees
- cacao trees
- cord grasses
- ferns
- strangler figs
- clover